Troubleshooting Guide
Stud Welding Unit N3

Nelson Bolzenschweiß-Technik GmbH & Co. KG, Flurstr. 7-19, 58285 Gevelsberg

TABLE OF CONTENTS

1. General Information 5
1.1 System Components 6
1.2 N3 Power Unit Functions 7
1.3 N3 Power Unit Components 8
1.4 Inverter Engine 9
1.5 Micro Processor 10
1.6 Power Unit Control Card 11
1.7 FSE Feeder Control Card 12
1.8 HMI Control Card 13
1.9 FSE 100 Feeder Functions 14
1.10 System Architecture 15
2. Wrong Stud Error 16
2.1 Feeding Problem 17
2.2 Studs builds up on the side walls of FSE 100 18
2.3 Chuck Problem 19
2.4 Referenz Methode 20
2.5 Push Test / Push Test ++ 21
2.6 Isolation Tube 23
2.7 No Contact Error 24
2.8 No Arc 25
2.9 Contact Light Always "On" 26
2.10 Arc Voltage Lost 27
2.11 Weld Cycle interrupted 28
2.12 Safety Circuit Error 29
2.13 Low Current NIO Error in Process Monitor 30
2.14 NIO ARC Voltage 31
2.15 Error in Gun / Head Movement 32
2.16 Head not retracted Position 33
2.17 Current Level error 34
2.18 Can Bus Error 35
3. Components 36
4. Fuse Problems 37
4.1 Fuse in Feeder is blown (90V) 37
4.2 Fuse (F1, F2, F3) in N3 power supply board are blown 38
4.3 Fuse (F4, F5, F6) in N3 power supply board are blown 39
4.4 Fuse (F 10) in N3 power supply board is blown 40
4.5 Fuse (F 11) in N3 power supply board is blown 41
4.6 Fuse (F 12) in N3 power supply board is blown 42
4.7 F1 in Inverter Module 43
5. Error Messages 44
5.1 Error Classes 44
5.2 Error List 45
5.3 Internal Errors Feeder 49

6. Hardware Errors Code 0x10-0x1F 50
6.1 Code: 0x10 Line contactor OFF! 50
6.2 Code: 0x11 Protective grid open 51
6.3 Code: 0x12 Switch protective grid 52
6.4 Code: 0x13 Temperature too high! 53
6.5 Code: 0x14 Phase under voltage! 54
6.6 Code: 0x15 Power supply unit error! 56
6.7 Code: 0x16 SPI-bus! 59
6.8 Code: 0x17 Battery undervoltage! 60
6.9 Code: 0x1D Protective circuit relay 61
6.10 Code: 0x1E Short-circuit / overload! 63
6.11 Code: 0x1F No voltage supply! 65
7. System Errors Code 0x00-0x0F 66
7.1 Code: 0x01 System Reset! 66
7.2 Code: 0x02 Fast ram! 67
7.3 Code: 0x03 Low power ram! 68
7.4 Code: 0x04 Dual port ram! 69
7.5 Code: 0x05 Dual port ram (init)! 70
7.6 Code: 0x06 Dual port ram (Watchdog)! 71
7.7 Code: 0x07 No configuration data! 72
7.8 Code: 0x08 Sytem IRQ (error!!!) 73
7.9 Code: 0x09 No communication with user panel 74
7.10 Code: 0x0A Inverter card! 76
7.11 Code: 0x0B Bus address! 77
7.12 Code: 0x0C No EEProm data! 78
8. Parameter Errors Code 0x20-02F 79
8.1 Code: 0x20 No welding program! 79
8.2 Code: 0x21 Data pool welding programs full! 80
8.3 Code: 0x22 Write error configuration data! 81
9. Welding Cycle Errors Code 0x30-0x3F 82
9.1 Code: 0x30 NIO weld! 82
9.2 Code: 0x31 No contact! 83
9.3 Code: 0x32 Current threshold 84
9.4 Code: 0x33 Arc voltage lost 85
9.5 Code: 0x34 No arc! 87
9.6 Code: 0x35 Welding cycle interrupted! 89
9.7 Code: 0x36 Synchronisation error! 90
9.8 Code: 0x37 Welding process active! 91
9.9 Code: 0x38 Welding process error! 92
9.10 Code: 0x39 Timeout welding process ! 93
9.11 Code: 0x3A No measured values! 94
9.12 Code: 0x3B Plunge obstruction! 95
9.13 Code: 0x3C Protective gas failure 96
9.14 Code: 0x3D Simulation 97

10. Infeed Errors Code 0x40-0x4F 98
10.1 Code: 0x40 No R-position! 98
10.2 Code: 0x41 No V-position! 99
10.3 Code: 0x42 Timeout infeed! 100
10.4 Code: 0x43 Infeed error! 101
10.5 Code: 0x4A Angular position NIO 102
11. Welding Tool Errors Code 0x50-0x5F 103
11.1 Code: 0x50 Servo controller defective! 103
11.2 Code: 0x51 Servo init. faulty! 104
11.3 Code: 0x52 Servo error input! 105
11.4 Code: 0x53 Servo overload current! 106
12. Feeder Errors Code 0x60- 0x6F 107
12.1 Code: 0x60 Rail filling level min.! 107
12.2 Code: 0x61 Feeder filling level min.! 108
12.3 Code: 0x62 Bunker filling level min.! 109
12.4 Code: 0x63 Feeder cover open! 110
12.5 Code: 0x64 Lack of compressed air! 111
12.6 Code: 0x65 Feeder key switch! 112
13. Feed Errors Code 0x70-0x7F 113
13.1 Code: 0x70 No stud fed! 113
13.2 Code: 0x71 Wrong stud! 114
13.3 Code: 0x72 Incorrect stud! 120
13.4 Code: 0x73 Feed fault loading pin! 121
13.5 Code: 0x74 Förderstörung optischer Sensor! 122
13.6 ode: 0x75 Feed fault optical sensor! 123
13.7 Code: 0x76 Stud feed protective circuit open! 124
13.8 Code: 0x77 Stud/program allocation 125
14. CAN Errors Code 0x80-0x8F 126
14.1 Overview CAN BUS Errors 126
14.2 Code: 0x80 CAN-message faulty! 127
14.3 Code: 0x81 CAN-Message Timout! 128
14.4 Code: 0x82 CAN transmission FIFO full! 129
14.5 Code: 0x83 CAN 1 bus error! 130
14.6 Code: 0x84 CAN 1 bus OFF! 131
14.7 Code: 0x85 CAN 1 bus error! 132
14.8 Code: 0x86 CAN 1 bus error! 133
14.9 Code: 0x87 CAN 2 bus error! 134
14.10 Code: 0x88 CAN 2 bus OFF! 135
14.10.1 Code: 0x89 CAN 2 bus error! 136
14.11 Code: 0x8A CAN 2 bus error! 137
14.12 Code: 0x8B CAN bus monitoring 138

15. External Communication Errors Code 0x90-0x9F 139
15.1 Code: 0x90 No program selection! 139
15.2 Code: 0x95 Incorrect interface module 140
15.3 Code: 0x96 Bus initialisation error! 141
15.4 Code: 0x97 No bus communication! 142
15.5 Code: 0x98 Bus Idle! 143
15.6 Code: 0x99 Bus reset! 144
16. Process Errors, Code 0xA0-0xAF 145
16.1 Code: 0xA0 Unacknowledged error! 145
16.2 Code: 0xA1 Process fault 146
17. Facility Errors, Code 0xB0-0xBF 147
17.1 Code: 0xB0 Feeder configuration error! 147
17.2 Code: 0xB1 Tool configuration error! 148
17.3 Code: 0xB2 Maintenance 80 149
17.4 Code: 0xB3 Maintenance 100 150
17.5 Code: 0xB4 Maintenance 151
17.6 Code: 0xB5 Error frequency 152
17.7 Code: 0xBA Ethernet ON 153
17.8 Code: 0xBB Ethernet OFF 154
17.9 Code: 0xBC Ethernet 155
17.10 Code: 0xBF Facility configuration 156

1. General Information

The error description section serves as a help for the analysis and rectification of problems which may occur during the commissioning or operation of the stud welding unit.

Error messages have the following structure:

- *Error class*
- *Error code*
- *Error information 1*
- *Error information 2*
- *Error information 3*
- *Error time*

All errors are assigned to error classes which signal the severity of the error (refer to the Error Classes subsection).

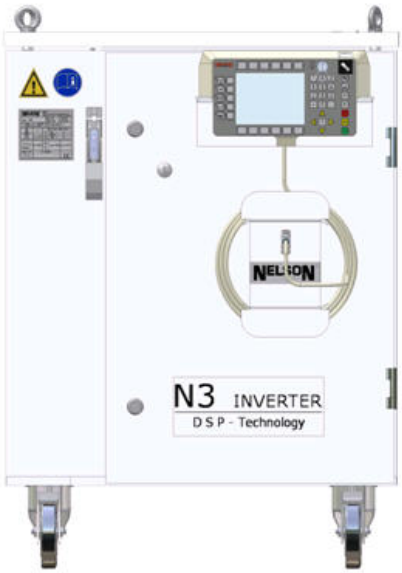
The errors as well as the respective information are explained in the following description. The error code is displayed or output in hexadecimal form.

The error code is output on the internal 7-segment displays of the N3 stud welding unit and in the system components, if available.

In the operating panel of the N3 stud welding unit, the error messages are displayed in plain text, including the error time (refer to the N3 Programming Manual).

The N3 stud welding unit continuously logs 50 consecutive errors in an error buffer. The occurring errors are saved in a manner protected against mains failure.

1.1 System Components

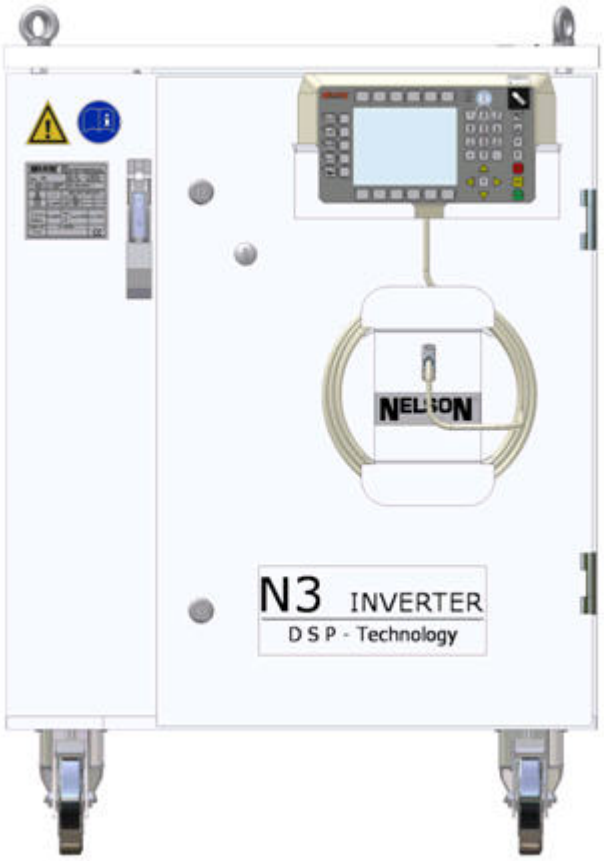


N3 Power Unit

FSE 100 Stud Feeder

KSE 100 Weld Head

1.2 N3 Power Unit Functions

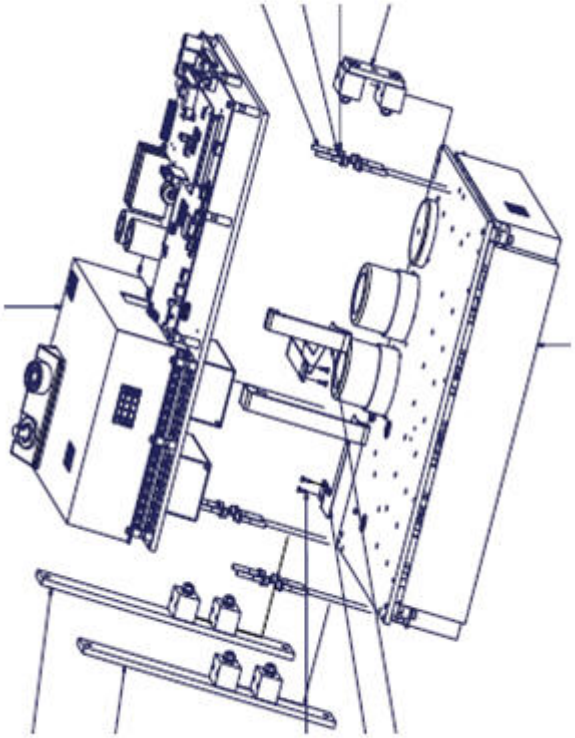


- ***Central Controller of Peripheral Devices***
- ***Develops and Controls Weld Current***
- ***HMI for Data Input and Feedback***
- ***Provides Interface with PLC/Robot Controller***

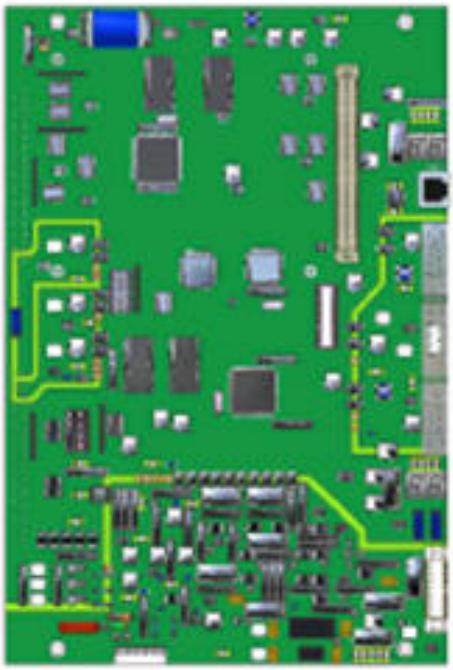
1.3 N3 Power Unit Components

The N3 can be broken down into 2 major systems:

Inverter Engine



Control (Micro Processors)



1.4 Inverter Engine

The Inverter Engine can also be broken down into 2 components:

Secondary Side

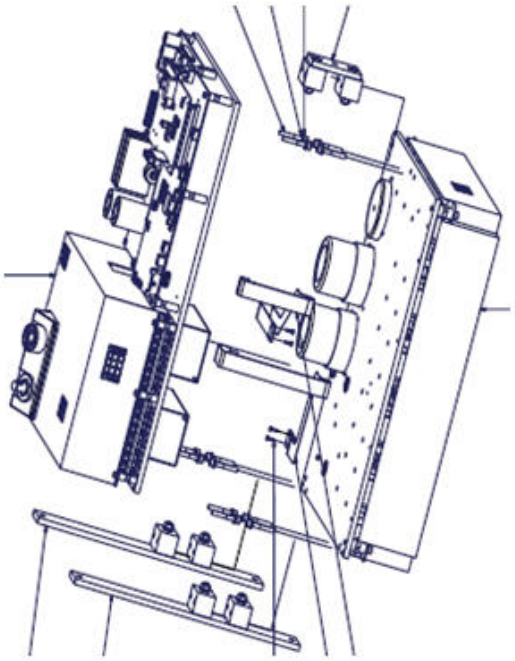
Low Voltage – High Current

Diode Pack (Rectifier)

Filter Capacitors

Pilot Circuit

Output SCR



Primary Side

High Voltage

Rectifier

Storage Capacitors

IGBT's (high voltage transistors)

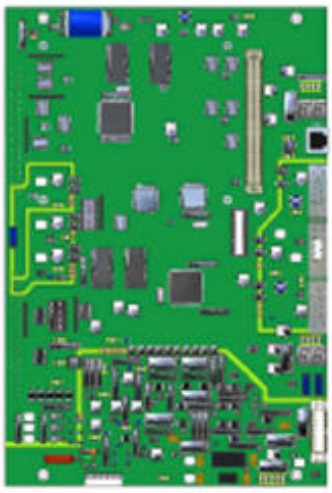
Snubbers (noise filter)

High Frequency Transformer

1.5 Micro Processor

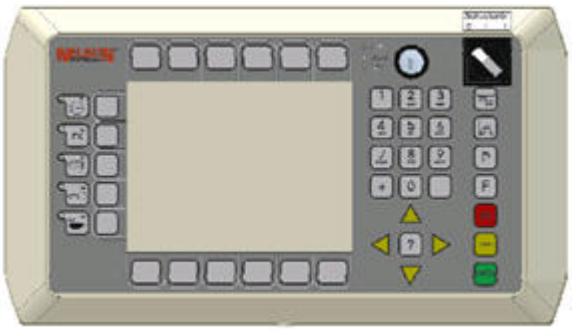
A typical N3 System has 4 micro processor and 1 additional processor for each output that is added to a system. The CPU's communicate to one another via a CAN Bus network.

Power Unit Control Card has 2 CPU's



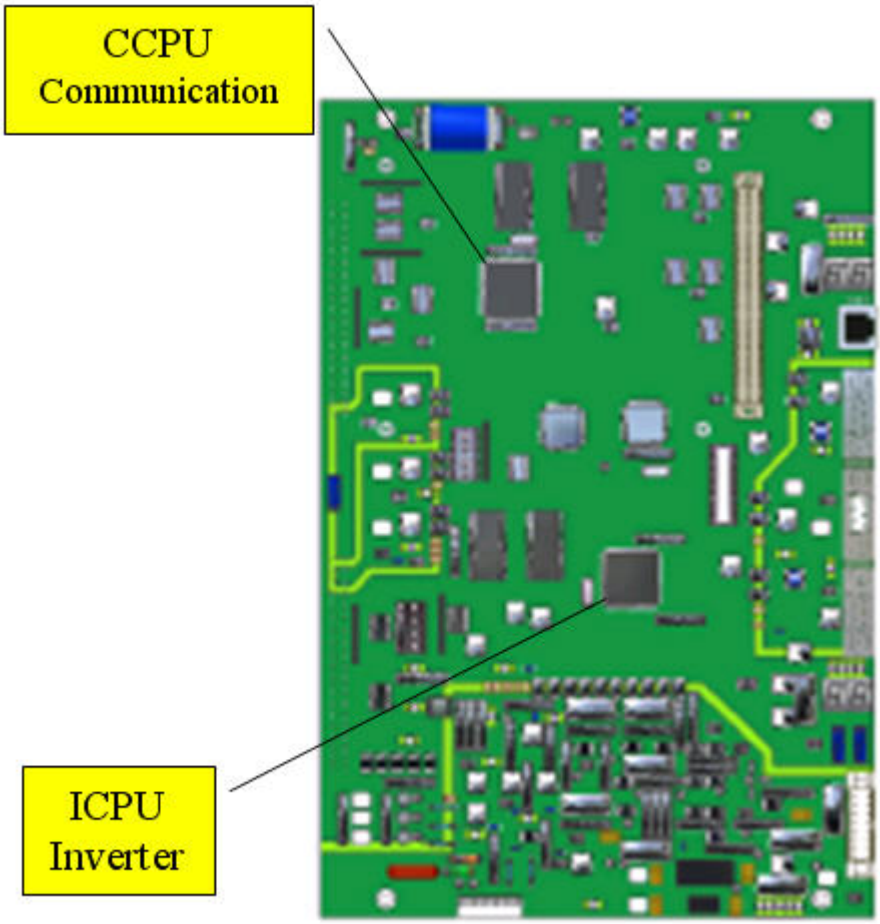
FSE Feeder Control Card has 1 CPU

HMI Control Card has 1 CPU



1.6 Power Unit Control Card

Micro Processor Functions:



CCPU Functions

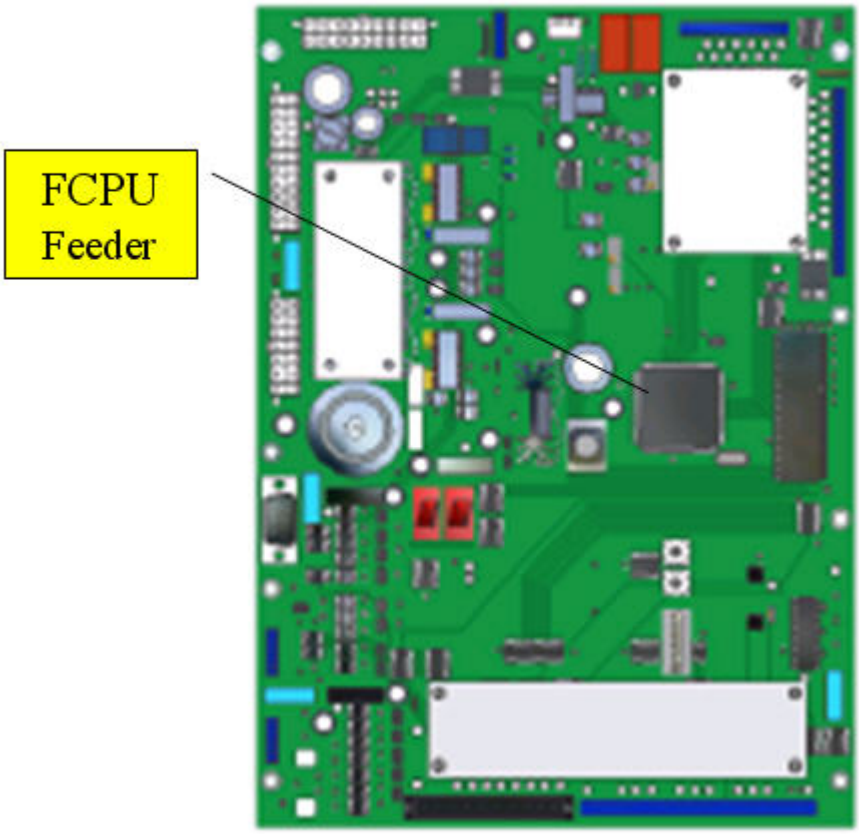
- Communication with external I/O
- Management of Weld Programs
- Transfer of Set Points and Control Variables
- Management of PLC/Robot interface

ICPU Functions

- Weld Current and Power Management
- Three Phase Voltage monitoring
- Process Data Management
- Error Flag Generation

1.7 FSE Feeder Control Card

Micro Processor Functions:

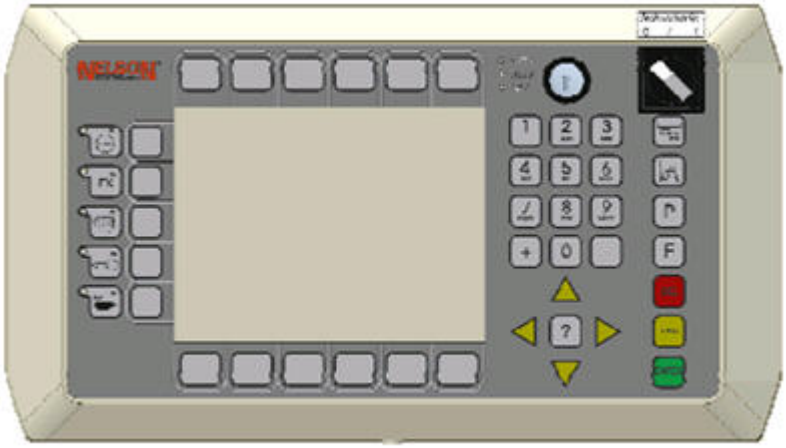


FCPU Functions

- Management of pneumatic valves for stud transportation and optional equipment
- Monitors external I/O of prox, lamps and switches
- Transfer of speed and positioning variables to Servo controller
- Transfer of process data variables for Arc Voltage and Servo Movement to ICPU
- Controls triggering of Output SCR

1.8 HMI Control Card

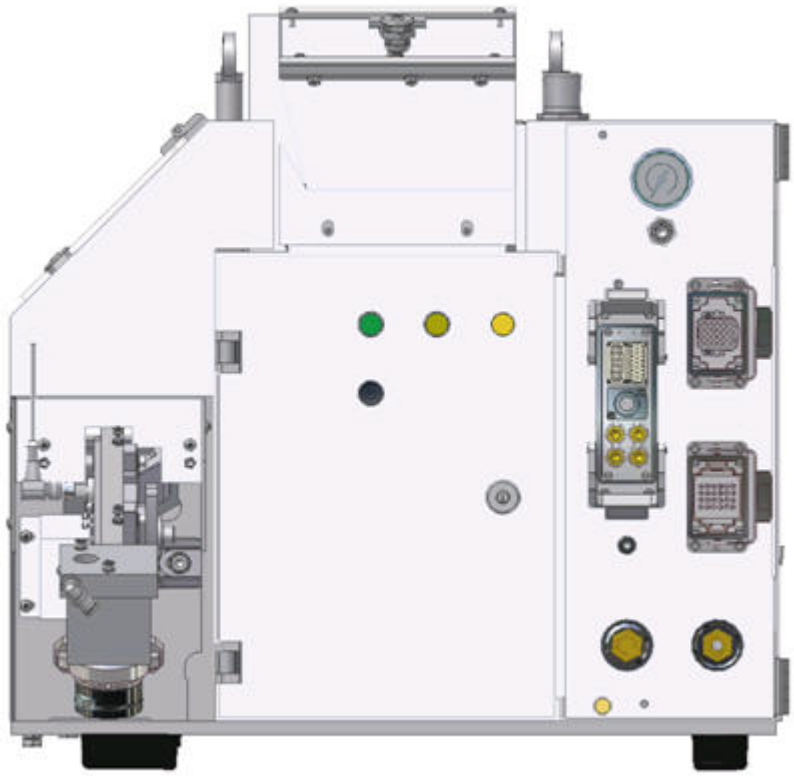
Micro Processor Functions:



HCPU Functions

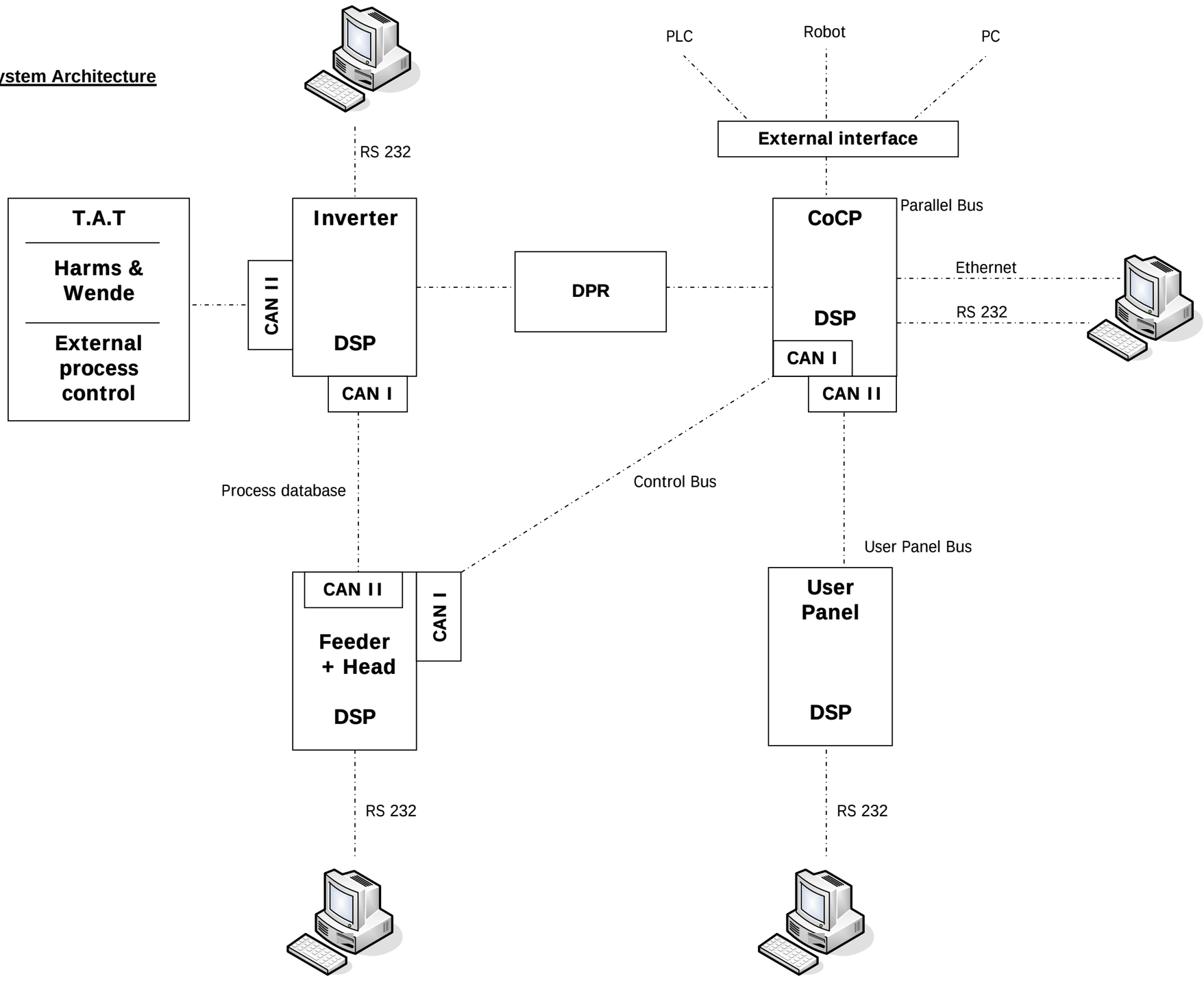
- User Data Input for Weld Programs and System Configuration settings
- Text and Graphical representation of Weld Process values
- Management of System Errors and Warnings
- Manual control of System Components
- System Diagnostic Tools

1.9 FSE 100 Feeder Functions

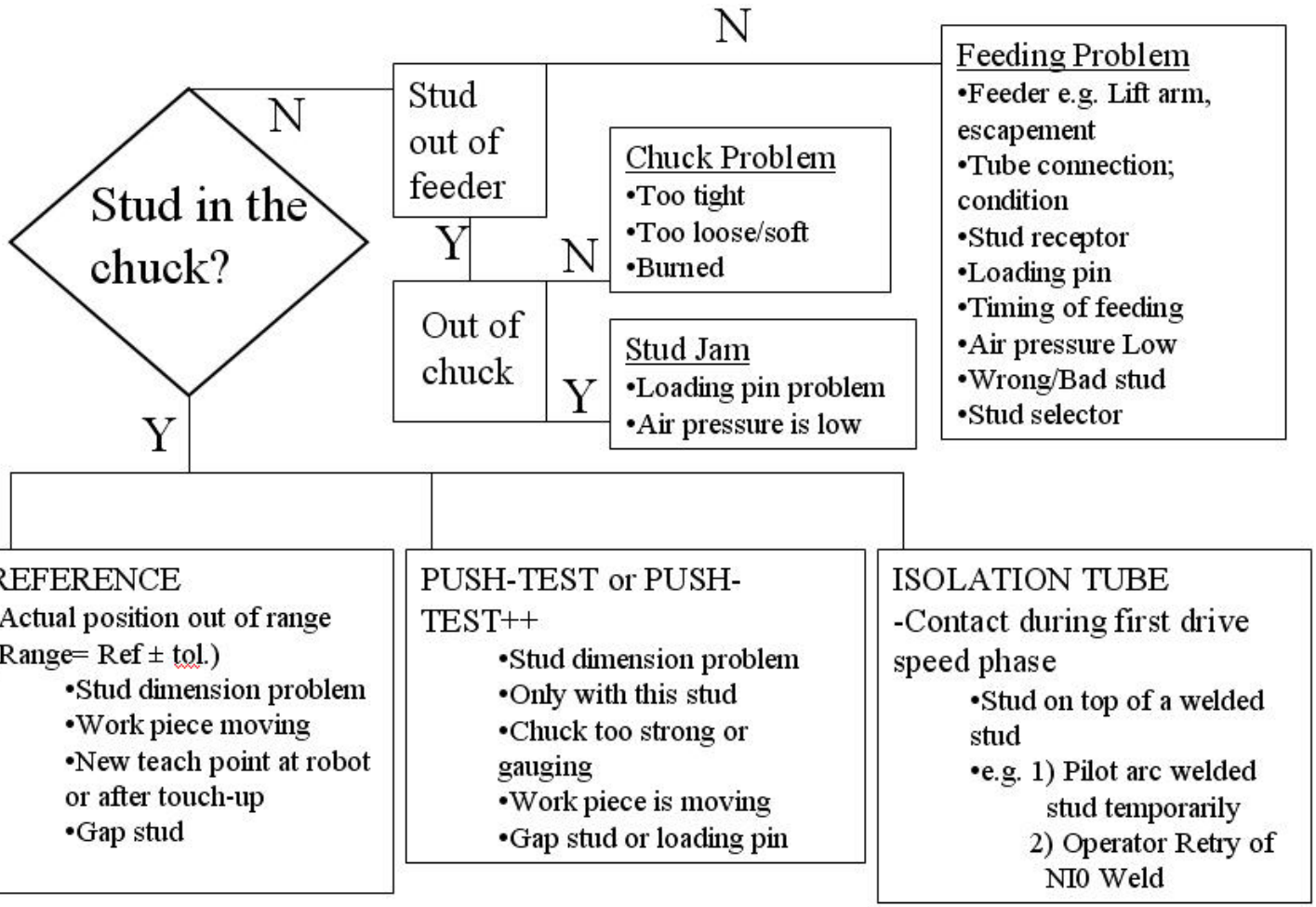


- Management of Stud Transportation to Weld Tool
- Stud level Control
- Pneumatic and Optional Device Control
- Weld Tool Management
- Networking Additional Outputs

1.10 System Architecture



2. Wrong Stud Error



2.1 Feeding Problem

Possible Causes:

- *Feeder e.g. lift arm escapement*
- *Tube connection, condition*
- *Stud receptor*
- *Loading pin*
- *Timing of loading*
- *Air pressure low*
- *Wrong/Bad stud*
- *Stud selector*

2.2 Studs builds up on the side walls of FSE 100

Symtom:

- *Lifting arm scoops up nothing because all the studs are on the sides and out of the reach of the lifting arm*

Solutions:

- *Open up air valve to vibrate feeder to shake FSE 100 every time you feed a stud*
- *Adjust the "minimum switch level" (inside of sorting container), up is possible, to increase the quantity of studs in this chamber.*
    - *Reason: With more studs in this chamber, together they became heavier and with this, more easily to fall down to the arm.*
- *Increase the speed in arm when it move to (back or home) position.*
    - *Reason: With more speed in arm movement, the feeder has a tendency to vibrate. You can also do that when the arm come to the front position, but you must take care to the studs don't throw from the arm.*

2.3 Chuck Problem

Possible Causes:

- *Too tight*
- *Too loose / soft*
- *Finger lost*
- *Burned*

2.4 Referenz Methode

Note:

- *Actual position out of range (Range = Ref. ± tolerance)*

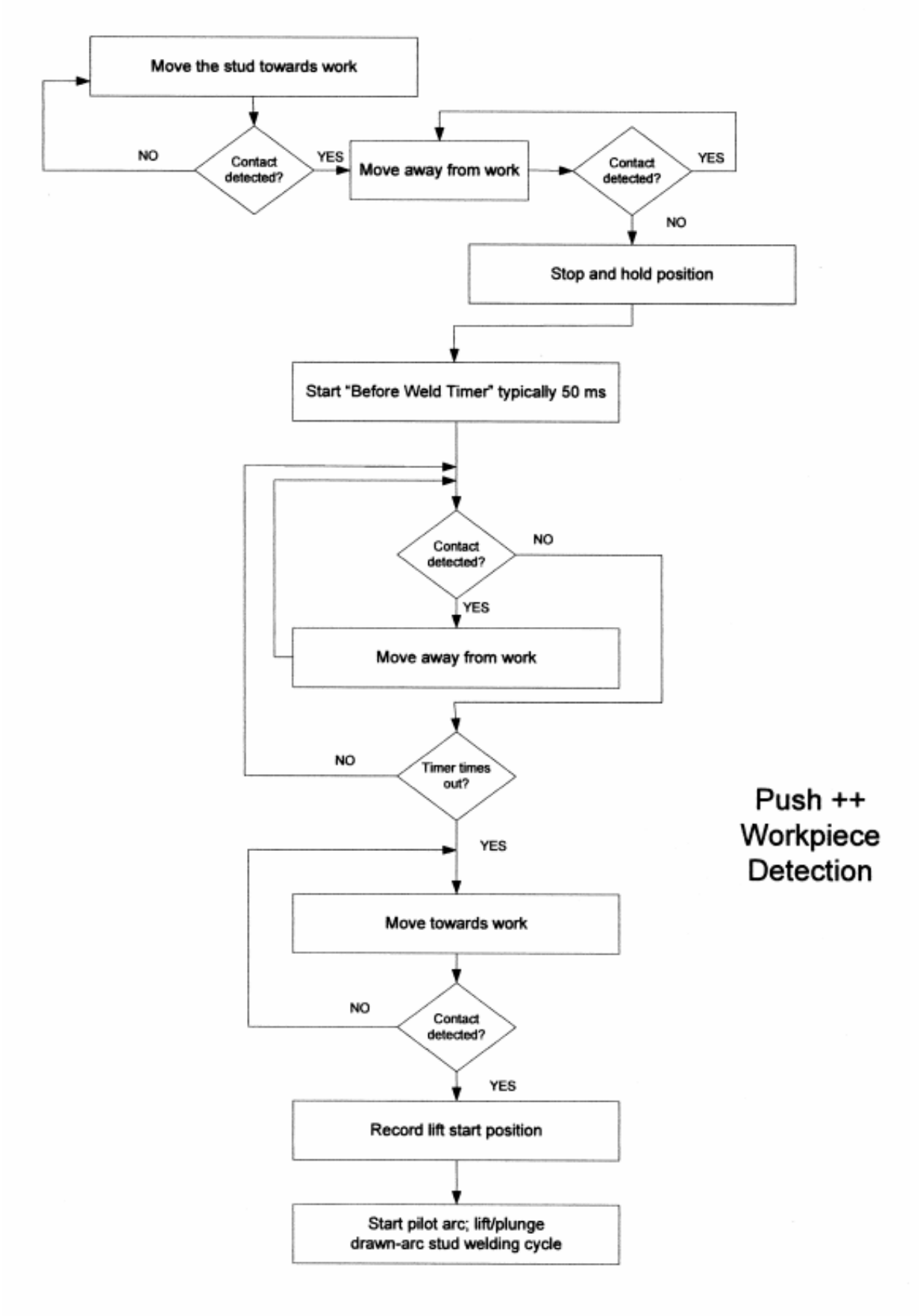
Possible Causes:

- *Stud dimension problem*
- *Workpiece moving*
- *New teach point at robot or after touch-up*
- *Gap stud / Loading pin*

2.5 Push Test / Push Test ++

Possible Causes:

- *Stud dimension problem*
- *Only with this stud (welcher?)*
- *Chuck too strong or gauging*
- *Gap stud / Loading pin*


Move the stud towards work
NO
Contact detected?
YES
Move away from work
Contact detected?
YES
NO
Stop and hold position
Start "Before Weld Timer" typically 50 ms
Contact detected?
NO
YES
Move away from work
NO
Timer times out?
YES
Move towards work
NO
Contact detected?
YES
Record lift start position
Start pilot arc; lift/plunge drawn-arc stud welding cycle
Push ++ Workpiece Detection

2.6 Isolation Tube

Note:

- *Contact during “first drive speed phase”*

Possible Causes:

- *Stud on the top of a welded stud e.g.:*
- *Pilot arc welded stud temporarily*
- *Operator retry of NIO welding*

2.7 No Contact Error

Possible Causes:

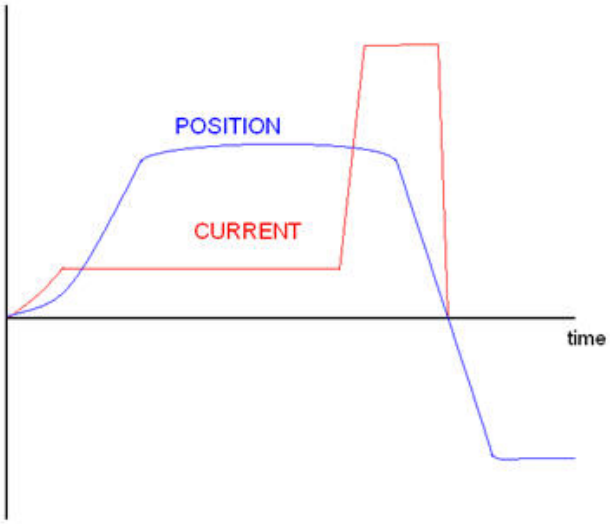
- *No Contact (distance between Head and Work piece)*
- *No Stud (only with isolation tube)*
- *External voltage sense lead cable broken or not connected*
- *External measure cable broken or not connected*
- *External sense lead cable not connected on feeder board*
- *Wrong polarity*
- *Measure cable to head broken or not connected*
- *Weld Cable wiring*
- *Feeder board defective*
- *N3 Control board defective*
- *Work piece or surface is dirty or with oil contamination*

2.8 No Arc

Possible Causes:

- *No lift or no movement head*
- *Work piece moving against stud*
- *Short circuit between work piece and stud*
- *Stud temporarily welded with pilot current*
- *Lift too short*
- *Inverter defect*
- *CAN-BUS – process data defect*
- *Feeder board problem*
  - *A/D Converter*
  - *Wiring on board*

After turning on the pilot arc for 15 ms, the arc voltage must be over 15V. If not, "no arc" error is active.



2.9 Contact Light Always "On"

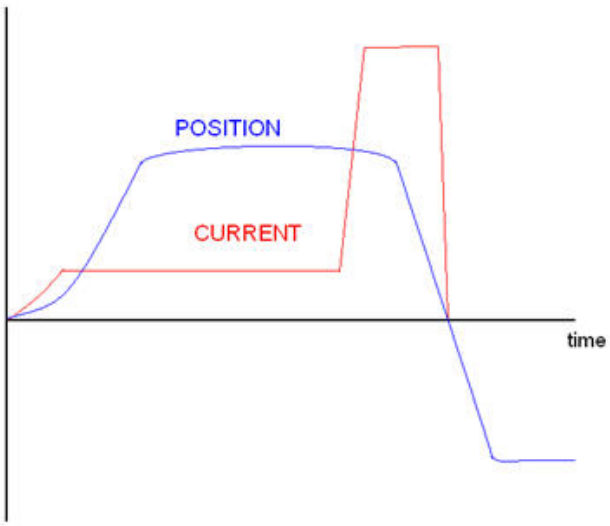
Possible Causes:

- *Internal weld head weld cable shorted to ground (housing)*
- *T-stud feeder only: Output SCR has bad isolation to housing*
- *Bad (shorted) output diode*
- *Weld head not retracted*

2.10 Arc Voltage Lost

Possible Causes:

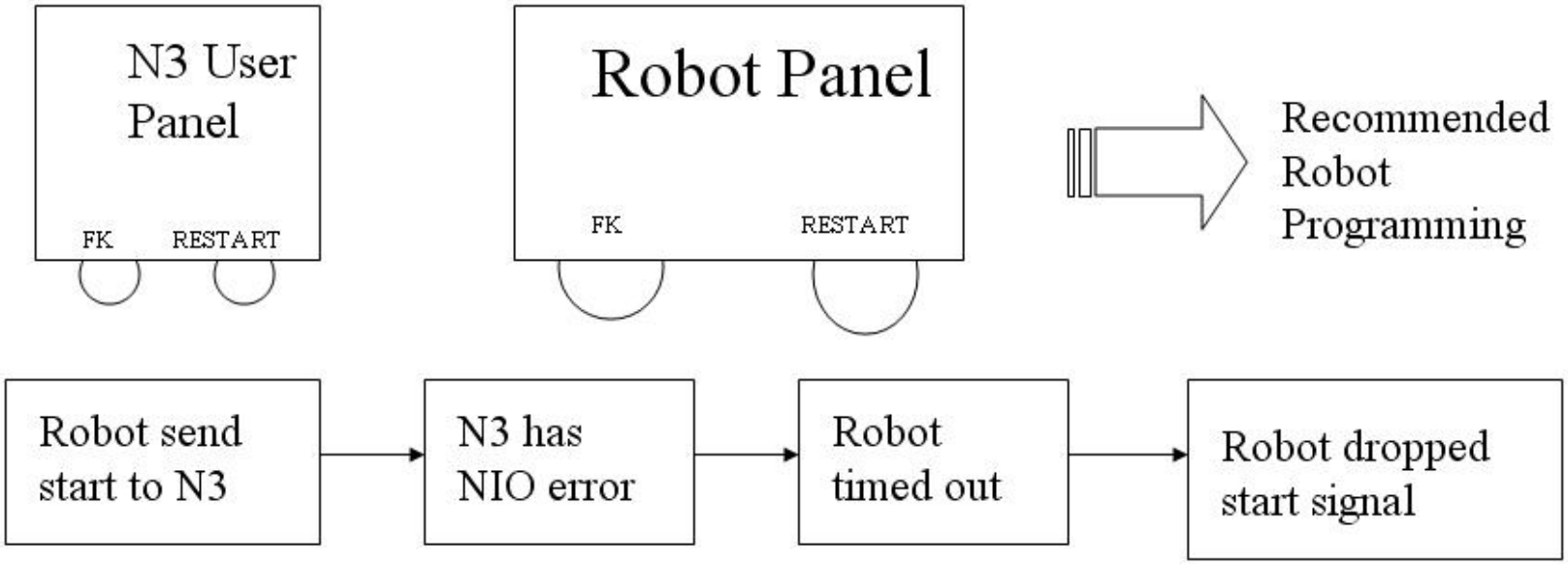
- *Lift is too high*
- *Work piece vibration*
- *Dirty work piece (Oil)*
- *Air blowing at arc*
  - *15 ms after pilot arc start, measure 4ms (16 samples)*
  - *Average voltage should be > 75 V*



2.11 Weld Cycle interrupted

Start signal from robot is dropped before weld complete (FK) is sent to robot. This could be caused by robot using Spot Welding Software (e.g. Fanuc Spot Tool) for stud welding

IN THE EVENT OF NIO WELD:



Work-Around (Temporarily suppressing this error)

Set NIO Count to zero ⇨ 'FK' is sent for NIO weld

2.12 Safety Circuit Error

Possible Causes:

- *User panel switch is "off"*
- *Safety gate or light screen is tripped*
- *Feeder daisy-chain termination plug is not inserted either in the feeder or in the N3*
- *External safety device problem or its wiring*

2.13 Low Current NIO Error in Process Monitor

Possible Causes:

1. Weld cable voltage drop is too high

- *Weld cable diameter is too high*
- *Weld cable length is too long*
- *Too many connections, loose connections or bad connections*
- *Chuck is not tight (fixed)*
- *Grounding to workpiece is not solid*

2. Inverter engine is bad (output diode or IGBT)

- *To check N3 terminal voltage:*
- *Flip dip switch to use internal voltage measurement as display to process monitor*
- *Use oscilloscope or data acquisition device to measure output voltage during a weld*

3. Input voltage is unstable (too low), or input cable is too long or too small Ø

4. Bad main relay contact

2.14 NIO ARC Voltage

Possible Causes:

1. *Work piece surface is dirty - arc voltage is too high*
2. *Molten metal bridging stud to work piece during main arc (Check: Process Monitor arc voltage curves for short circuit)*
    - *Current is too high (voltage is too low) for the application)*
    - *Lift is not enough*
    - *Weld time is too long and weld current is too low, causing short circuit*

2.15 Error in Gun / Head Movement

Time out movement, head not retracted

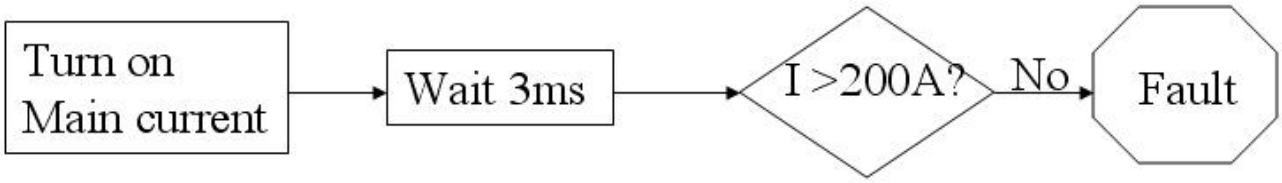
1. *No/Low air pressure*
2. *Gun cable or its connection*
3. *Servo axis is blocked*
    - *Stud jam*
    - *Feed tube is not secured to the head. If moves and blocks the axis*
    - *To check:*
        - ➢ *Release break*
        - ➢ *Move weld axis by hand*
        - ➢ *Check LED (encoder pulses) flashing on the feeder board*
        - ➢ *In software version 2, the axis position is displayed on the user panel when break is released*
4. *Feeder board: 90V fuse is blown*

2.16 Head not retracted Position

Possible Causes:

1. *Proximity switch is loose*
2. *Axis is blocked*
3. *Cable from head to feeder is damaged*
4. *Low air pressure*
5. *Chuck is welded to work piece*
6. *Stud in the loading head blocks the movement*
7. *Protective bellow is not installed properly or has no bleed hole*
8. *Spatter holds the chuck to the stud after welding*

2.17 Current Level error



1. *Output cable has too much inductance*
   - *Uncoil cable*
   - *Keep weld cable away from ferrous material*

2. *N3 inverter engine failed – e.g. output diode failed*

2.18 Can Bus Error

Possible Causes:

1. *CAN connector on each board*
2. *CAN termination plug is missing on the last feeder in the DAISY-Chain*
3. *One feeder is disconnected without cycle power*
4. *Bad CAN cable*
5. *Feeder board or control board is damaged*
6. *45V CAN Bus power supply will see error message*
7. *CAN I & CAN II positions are swapped on feeder PCB on control PCB*

3. Components

Major Components	Failure Symptoms
Change / Discharge PCB	– No current – Long discharge time – Main switch (relay can be wounded)
IGBT or IGBT driver	– No current – Low output current, if half side is working
Main relay	– Irregular current waveform (ripple); only at high weld current – NIO current
Output diode	– Low current at high weld current – Bad smell (right side of housing black soot)
Main switch	– Tripping
Main transformer	– No current – Low current
Capacitor for DC BUS	– Irregular current waveform
Feeder PCB	– CAN BUS error – No movement – Communication error – 7-Segment stopper – CAN BUS adress
Control PCB	– 7-Segment not running on CoCP
IGBT snubber	– NIO current – Error message – 15V supply for IGBT drive current

4. Fuse Problems

4.1 Fuse in Feeder is blown (90V)

Possible Error Messages:

- *Movement timeout*
- *Power supply 90V*

Check:

- *Voice coil in the head is burned up*
- *Head cable is damaged*
- *Feeder board is damaged (servo amplifier has a short circuit)*
- *Wrong Fuse (e.g. low rating, fast blow)*

4.2 Fuse (F1, F2, F3) in N3 power supply board are blown

Note:

- *3 phase head/gun supply - ERROR MESSAGE:*
- *90V power supply on the AC side*

Check:

- *If hand gun is used, gun coil is shorted*
- *Gun cable has short circuit*
- *If multiple guns are used, they move at the same time, causing overload on 90V power supply*

4.3 Fuse (F4, F5, F6) in N3 power supply board are blown

Note:

- *24V power supply on the AC side (for: feeder, user panel, main relay, safety circuit and internal to N3)*

Symptoms:

- *User panel has no power*
- *Control board has no power*

Causes:

- *Rectifier has short circuit*
- *DC/DC converter has short circuit*

4.4 Fuse (F 10) in N3 power supply board is blown

Note:

- *24V power supply for feeder, NTC Box, user panel (external to N3)*

Symptoms:

- *User panel is not powered up*
- *Feeder is no powered up*

Causes:

- *Short circuit in feeder, NTC-Box, User panel*
- *Wiring to external devices*

4.5 Fuse (F 11) in N3 power supply board is blown

Note:

- *24V power supply for N3 (internal use)*

Symptoms:

- *User panel is powered on, but with “waiting” message*
- *LED on control board is off*
- *7 – Segment display is not rotating*

Causes:

- *Short circuit in DC/DC converter on power supply board*
- *Short circuit on control board*

4.6 Fuse (F 12) in N3 power supply board is blown

Note:

- *90V supply on the PC side*

Check:

- *If hand gun is used, gun coil is shorted*
- *Gun cable has short circuit*
- *If multiple guns are used, they move at the same time, causing overload on 90V power supply*

4.7 F1 in Inverter Module

Note:

- *170A on input voltage primary side*

Symptom:

- *No weld current*

Causes:

- *IGBT (part number 86-02-85)*
- *IGBT snubber network (part number 66-08-22)*
- *IGBT driver board (part number 66-06-59)*

5. Error Messages

5.1 Error Classes

Class	Priority	Acknowledgement required	
0	**Low**	**No**	Warning
1	↓	**Yes**	Error
2		**Yes**	Error; parts of the stud welding system switched off
3	**High**	**Yes**	Serious error; flawless operation of the N3 stud welding system not possible! The power supply unit is switched off.

5.2 Error List

System errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
System reset				1	0x01
Error FT-RAM				3	0x02
Error LP-RAM				3	0x03
Error DP-RAM				3	0x04
DP-RAM not initialised				3	0x05
DP-RAM watchdog				3	0x06
No configuration data				1	0x07
System interrupt				3	0x08
No communication operating panel				1	0x09
Error inverter card				3	0x0A
Error bus addresses				3	0x0B
No EEProm data				3	0x0C
Hardware errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
Line contactor OFF				2	0x10
Protective grid open!				2	0x11
Switch protective grid bridging				2	0x12
Temperature	Error information			3	0x13
Phase failure				3	0x14
Error power supply unit	Error information			3	0x15

SPI bus!				3	0x16
Battery undervoltage				2	0x17
Protective relay open	Outp. 1, ...			2	0x1D
Short-circuit/overload				3	0x1E
No voltage supply				3	0x1F
Parameter errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
No welding program	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x20
Data pool welding program full				2	0x21
Write error configuration data				3	0x22
Welding cycle errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
NIO weld	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x30
No contact	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x31
Current threshold!	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x32
Arc break	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x33
No arc	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x34
Welding cycle interrupted	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x35
Synchronisation error	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x36
Welding process active	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x37
Error welding process	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x38
Timeout welding process	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x39
No measuring data	Outp. 1, ...	Type 1,...	Prog. 1, ...	0	0x3A
Plunge obstruction	Outp. 1, ...			0	0x3B

Failure protective gas	Outp. 1, ...			1	0x3C
Simulation	Outp. 1, ...			0	0x3D
Infeed errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
No R-position	Outp. 1, ...			1	0x40
No V-position	Outp. 1, ...			1	0x41
Timeout infeed	Outp. 1, ...			1	0x42
Error infeed	Outp. 1, ...			1	0x43
Angular position NIO	Outp. 1, ...			1	0x4A
Welding tool errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
Servo controller defective	Outp. 1, ...			2	0x50
Servo init. faulty	Outp. 1, ...			2	0x51
Servo error input	Outp. 1, ...			2	0x52
Servo overload current	Outp. 1, ...			2	0x53
Feeder errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
Rail filling level min.	Outp. 1, ...			1	0x60
Feeder filling level min.	Outp. 1, ...			0	0x61
Bunker filling level min.	Outp. 1, ...			0	0x62
Feeder cover open	Outp. 1, ...			0	0x63
Lack of compressed air	Outp. 1, ...			1	0x64
Feeder key switch	Outp. 1, ...			0	0x65
Feed errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**

No stud fed	Outp. 1, ...			1	0x70
Incorrect stud	Outp. 1, ...			0	0x71
Feed fault intelligent stud feed	Outp. 1, ...			1	0x72
Feed fault loading pin	Outp. 1, ...			1	0x73
Feed fault optical sensor	Outp. 1, ...			1	0x74
Feed position selector	Outp. 1, ...			1	0x75
Stud feed protective circuit open	Outp. 1, ...			2	0x76
Error stud/prog. allocation	Outp. 1, ...	Type 1,...	Prog. 1, ...	1	0x77
No welding component delivered	Outp. 1, ...			1	0x7A
Error separation	Outp. 1, ...			1	0x7B
CAN errors	**Information 1**	**Information 2**	**Information 3**	**Class**	**Code**
CAN message faulty				0	0x80
CAN message timeout				0	0x81
CAN transmission FIFO full!				2	0x82
CAN 1 bus error				2	0x83
CAN 1 bus error bus OFF				2	0x84
CAN 1 bus error				0	0x85
CAN 1 bus error				0	0x86
CAN 2 bus error				2	0x87
CAN 2 bus error bus OFF				2	0x88
CAN 2 bus error				0	0x89
CAN 2 bus error				0	0x8A

5.3 Internal Errors Feeder

Error	Code
Voltage 90 V servo	0xE0
Voltage 15 V driver servo	0xE1
Voltage 5 V interface	0xE2
Voltage 5 V CAN	0xE3
Voltage 24 V	0xE4

6. Hardware Errors Code 0x10-0x1F

6.1 Code: 0x10 Line contactor OFF!

Line contactor OFF!	**Code: 0x10**

Description:

- The line contactor is switched off and the voltage supply of the power section and the external system components (feeder, adjustment control tack gripper, etc.) has been interrupted.

6.2 Code: 0x11 Protective grid open

Protective grid open!	**Code: 0x11**

Description:

- The protective grid circuit is open and the voltage supply for the external system components has been interrupted. An active welding process will be executed until the next process stage. An active feed process will be terminated.

Possible Causes:

1. *User panel switch is "off"*
2. *Safety gate or light screen is tripped*
3. *Feeder daisy-chain termination plug is not inserted either in the feeder or in the N3*
4. *External safety device problem or its wiring*

6.3 Code: 0x12 Switch protective grid

Switch protective grid!	**Code: 0x12**

Description:

- **Theoperator protection** activated by the open protective circuit, **has been** disabled via the key switch at the N3 . This, for example, facilitates welding head feed, stud feed, etc.

6.4 Code: 0x13 Temperature too high!

Temperature too high!	Code: 0x13

Description:

- The maximum temperature of the circuit part or component specified in Information 1 has been exceeded.

The code listed in the Information 1 column indicates the module.

1	Control transformer
2	Welding transformer
3	Pilot current choke
4	Output thyristor
5	Power section primary side
6	Power section secondary side
7	Printed circuit board CoCP/InCP

6.5 Code: 0x14 Phase under voltage!

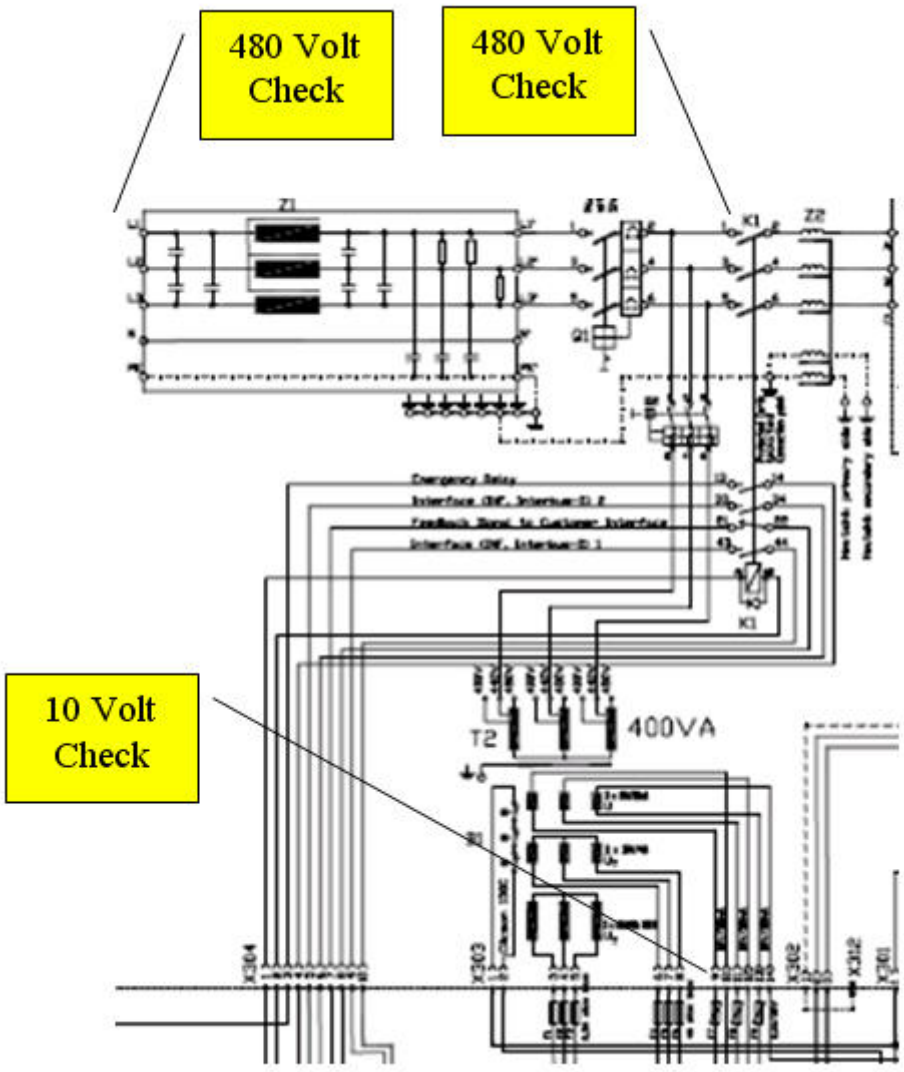
Phase under voltage!	Code: 0x14

Description:

- *One or more volt phases are not detected or missing in the mains input circuit of the N3.*

Causes:

- *Loose or bad connection*
- *Bad contacts on main disconnect*
- *Bad winding or connection on control transformer*
- *Open multi-fuse F7, F8, F9*
- *Bad connection between power supply board and control board*
- *Damaged control board*



- *Check 400 or 480 Volt for all three phases at L1, L2, L3 input power connection*
- *Check 400 or 480 Volt for all three phases at K1 main relay input side – Main disconnect is ok*
- *Disconnect X303 and check for 10 Volt on pins 9-10,11-12,13-14 – Control transformer is ok*
- *Power off and remove control card. Do a continuity check between pins 9 on X303 and pins 32c on X320, 10 to 32a, 11 to 31c, 12 to 31a, 13 to 30c and 14 to 30a – Multi-fuses are ok*
- *Check male pins on control card. If ok then replace circuit board.*

6.6 Code: 0x15 Power supply unit error!

Power supply unit error!	Code: 0x15

Description:

- *The code listed in the Information 1 column indicates the module.*
  - *One or more power supply voltages are not detected*
  - *The code listed in Information 1 indicates the cause of the error.*

1	Temporary fault
2	Phase failure L1
3	Phase failure L2
4	Phase failure L3
5	Voltage failure 15V IGBT driver card
6	Voltage failure CAN supply operating panel
7	Voltage failure CAN supply Feeder
8	Voltage failure work piece contacting/contact detection

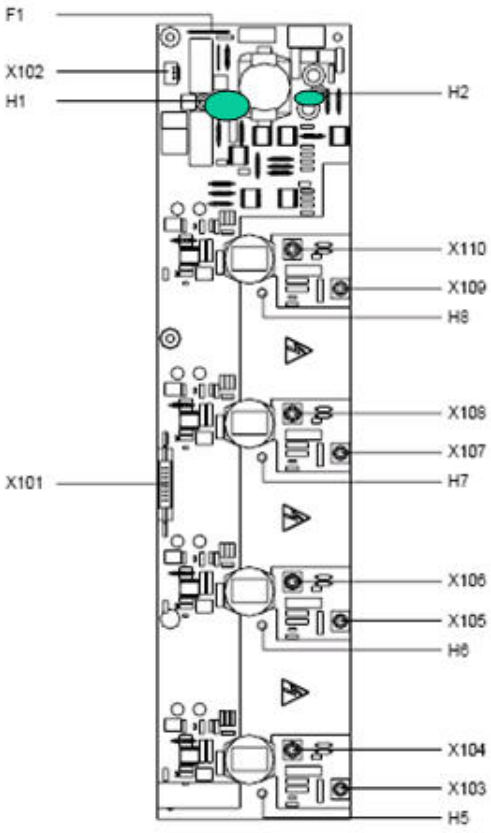
Causes:

- *Open fuses on power supply board*
- *Faulty dc/dc converters*
- *Poor connection between power supply board and control board*
- *Faulty control board*

Solutions:

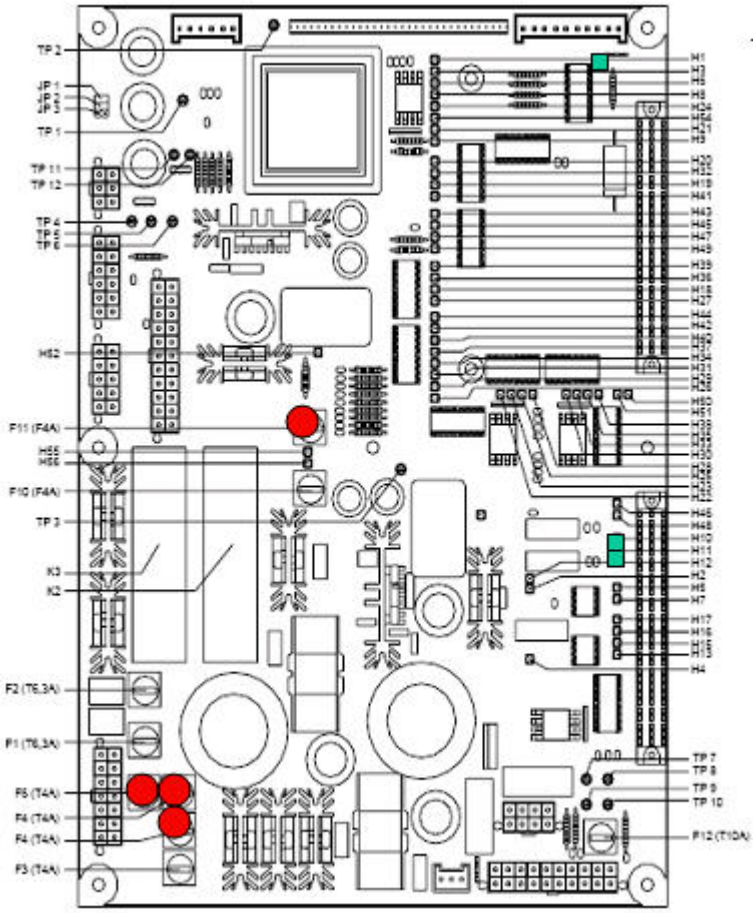
- *Code 1 temporary fault (surge was detected on power up)*
- *Cycle power, if fault returns then check input voltage*
- *Code 2, Code 3, Code 4 see phase failure*

Code 5 Voltage loss 15V IGBT driver card



- *Open back door on N3 and look for the green LED H1 and H2 on the IGBT driver board. If this on then the power supply board and IGBT board are ok.*
- *If not on check fuses F4, F5, F6 on power supply board and connection between X302 on the power supply board and X102 on IGBT driver board. If fuses and connection is ok then replace power supply board.*
- *Check connection between X101 on IGBT board and X201 on control board.*
- *Replace control board.*

Code 6-7-8 Voltage loss CAN power supply Control panel- Voltage loss CAN power supply Feeder-Voltage loss Work piece contact / contact detection



- *Check for green LED's H10, H11, H14 on power supply board.*
- *If off, check fuses F4, F5, F6 and F11*
- *If fuses are ok and no LED's then check for 30 to 50 vac on connector X303 at pins 6,7,8. If not then replace control transformer.*
- *If LED's are on then check that the power supply board and control board connection is seated properly.*
- *If the boards are seated properly and no bent pins or arcing then replace control board*

6.7 Code: 0x16 SPI-bus!

SPI bus!	Code: 0x16

Description:

- An error has occurred on the inverter card (InCP) during communication via the SPI bus.

Note:

- The stud welding system must be switched off and back on again or the printed circuit board has to be replaced!

6.8 Code: 0x17 Battery undervoltage!

Battery undervoltage!	Code: 0x17

Description:

- The battery for data backup (configuration data, welding parameters, etc.) in the N3 indicates an undervoltage.
  The voltage value is < 2.1 V.

Note:

- The battery has to be replaced! Before replacing the battery, a data backup must be carried out.

6.9 Code: 0x1D Protective circuit relay

Protective circuit relay!	Code: 0x1D

Description:

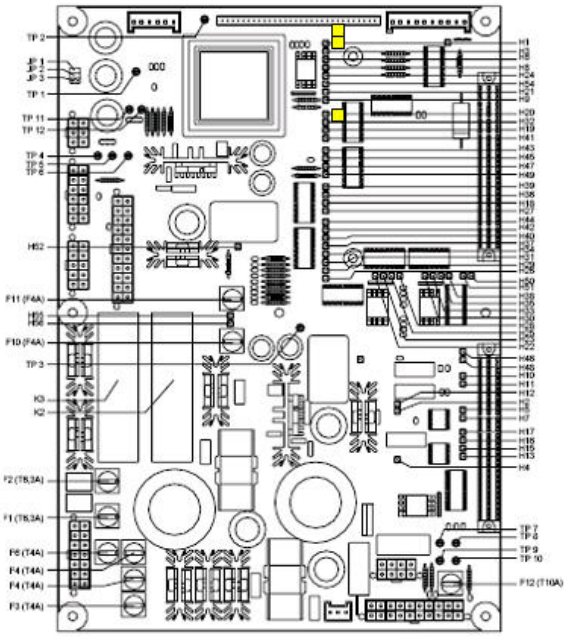
- *The two safety relays (K2 and K3) on the power supply board are open*

Causes:

- *Open circuit in safety hard wiring connections*
- *System has detected a problem and opened the relays internally*
- *Damaged K2/K3 relays*
- *Damaged power supply board transistor due to reverse polarity connection*

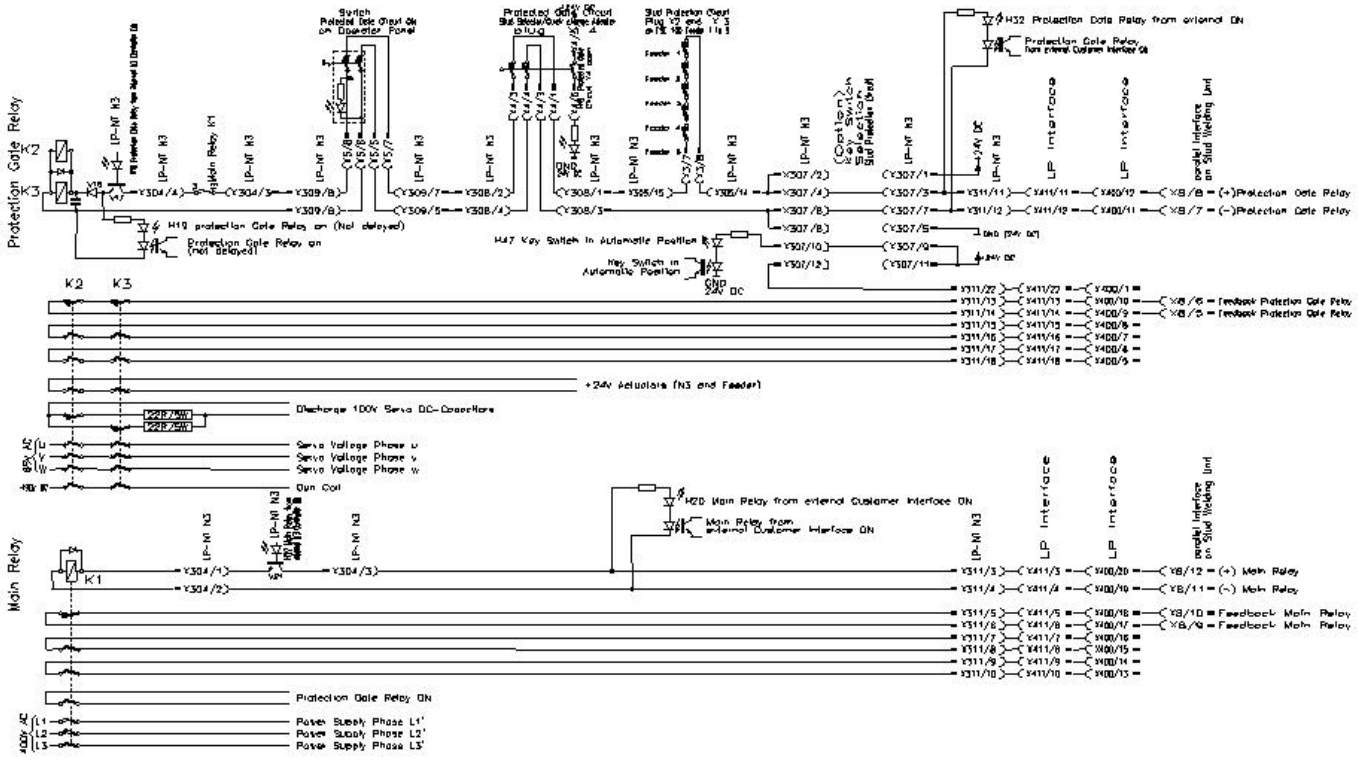
Solution:

- *Open front door of N3 and look on the power supply board for LED's H18,H19,H32 to see if they are lit yellow, this will determine if it is internal or external or a bad relay*



Identification	H18
Designation	*Protective Guard On By Internal Controller*
Description	H18 *on* / off: ***The protective guard has been switched on by the internal N3 control system*** / *The protective guard has been switched off by the internal N3 control system*
Identification	**H19**
Designation	*Feedback Protective Guard Relay On*
Description	H19 *on* / off: ***Protective guard relay has been switched on by the internal N3 control system and external robot control system*** / *Protective guard relay has been switched off by the internal N3 control system or external robot control system (customer interface)*
Identification	**H32**
Designation	*Protective Guard Relay On By External Customer Interface*
Description	H32 *on* / off: ***Protective guard relay switched on by the external robot control system (customer interface)*** / *Protective guard relay switched off by the external robot control system (customer interface)*

Safety Circuit:


Protection Gate Relay
K2
K3
Main Relay
K1
H10 protection Gate Relay on (Not delayed)
Protection Gate Relay on (Not delayed)
H47 Key Switch in Automatic Position
Key Switch in Automatic Position
H32 Protection Gate Relay from external ON
Protection Gate Relay, from external Customer Interface ON
H20 Main Relay from external Customer Interface ON
Main Relay from external Customer Interface ON
LP Interface
parallel Interface on Stud Welding Unit
+24V Actuators (N3 and Feeder)
Discharge 100V Servo DC-Capacitors
Servo Voltage Phase u
Servo Voltage Phase v
Servo Voltage Phase w
Gun Coil
Protection Gate Relay ON
Power Supply Phase L1'
Power Supply Phase L2'
Power Supply Phase L3'
Feedback Protection Gate Relay
Feedback Main Relay
Main Relay

6.10 Code: 0x1E Short-circuit / overload!

Short-circuit / overload!	Code: 0x1E

Description:

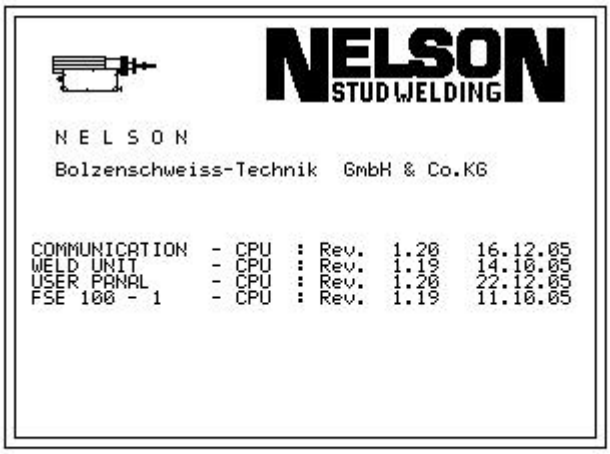
- An overload or short-circuit has occurred in the circuit of the digital output circuit listed in Information 1. The output circuit is switched off.
- The N3 system has detected a over current circuit on the X3 connection to the feeder.

Causes:

- *Faulty control cable*
- *Faulty feeder circuit board*
- *Mismatch in feeder circuit board version and software version.*
- *Mismatch in feeder software version*

Solution:

- *Replace control cable from N3 to feeder*
- *Check software version on FSE*


NELSON
STUD WELDING
N E L S O N
Bolzenschweiss-Technik GmbH & Co.KG
COMMUNICATION - CPU : Rev. 1.20 16.12.05
WELD UNIT - CPU : Rev. 1.19 14.10.05
USER PANAL - CPU : Rev. 1.20 22.12.05
FSE 100 - 1 - CPU : Rev. 1.19 11.10.05

- *Check software version for possible mismatch. The version is located under INFO – SOFTWARE .*

6.11 Code: 0x1F No voltage supply!

No voltage supply!	Code: 0x1F

Description:

- The voltage supply for a circuit part or component is missing.

  Information 1: Indicates the respective output.

  Information 2: Indicates the missing voltage supply – refer to Internal Errors.

7. System Errors Code 0x00-0x0F

7.1 Code: 0x01 System Reset!

Reset!	Code: 0x01

Definition:

- The N3 has carried out a restart. The system has stopped and restarted the communication processor. All temporary variables have been deleted.

Cause:

- A manual reset was carried out.
- The watchdog monitoring has caused a reset.
- A new interface configuration has been entered. The system must reboot to establish communication with interface card.
- One or more processors has stopped communicating on the CAN network.

Solutions:

- Quit error and proceed.
- Determine which processor has stopped and replace circuit board.

7.2 Code: 0x02 Fast ram!

Fast RAM!	Code: 0x02

Description:

- During initialisation, the N3 has detected an error while testing the <**fast RAM**> memory. The test comprises the writing and reading of the memory using special parameters.

Note:

- Operation is not possible. The printed circuit board may have to be replaced.

7.3 Code: 0x03 Low power ram!

Low-power RAM!	Code: 0x03

Description:

- During initialisation, the N3 has detected an error while testing the <**l**ow-**p**ower **RAM**>.
  The test comprises the writing and reading of the memory using special parameters.

Note:

- Operation is not possible. The printed circuit board may have to be replaced.

7.4 Code: 0x04 Dual port ram!

Dual-port RAM!	Code: 0x04

Description:

- During initialisation, the N3 has detected an error while testing the <**d**ual-**p**ort **RAM**>. The test comprises the writing and reading of the memory using special parameters.

Note:

- Operation is not possible. The printed circuit board may have to be replaced.

7.5 Code: 0x05 Dual port ram (init)!

Dual-port RAM (init)!	Code: 0x05

Description:

- The N3 has not received any confirmation (feedback) from the inverter CPU during initialisation of the < dual-port RAM >. The data exchange between communication CPU and the inverter CPU is faulty.

Note:

- Operation is not possible. The printed circuit board may have to be replaced.

7.6 Code: 0x06 Dual port ram (Watchdog)!

Dual-port RAM (watchdog)!	Code: 0x06

Description:

- The data exchange between the communication CPU and the inverter CPU is not flawless, the timeout condition has expired.

Note:

- The N3 must be restarted via a manual reset or by switching it off and back on again.

7.7 Code: 0x07 No configuration data!

No configuration data!	Code: 0x07

Description:

- During initialization, the N3 has detected that invalid configuration data or no configuration data at all are available. The memory for the configuration data has been deleted and then filled with default values.
- The system detects devices connected on the CAN network but there is no information in the configuration file

Note:

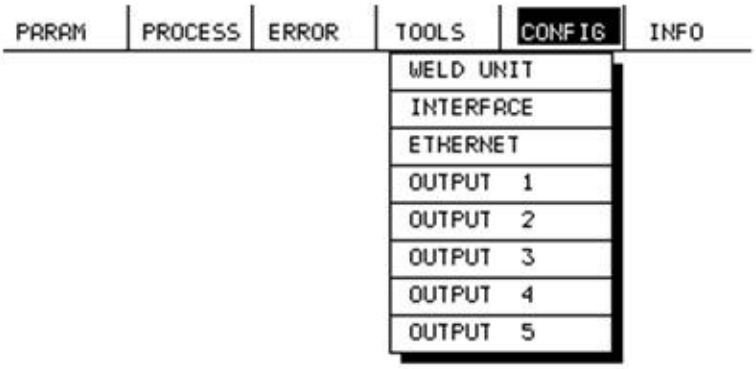
- The stud welding system must be re-configured!

Causes:

- *Battery backup has failed during power off*
- *A component has been added or removed from the system.*

Solutions:

- *Replace battery and restore system configuration information*



- Enter Weld Unit Data
  - Language
  - Date
  - Time
- Enter Interface Data
- Enter Output Data
  - Weld tool
  - Feeder type (comp data)

7.8 Code: 0x08 Sytem IRQ (error!!!)

System IRQ (error!!!)	Code: 0x08

Description

- An unauthorised interruption has been caused by a hardware or software error.

Note:

- The N3 must be restarted via a manual reset or by switching it off and back on again.

7.9 Code: 0x09 No communication with user panel

No communication with user panel	Code: 0x09

Description:

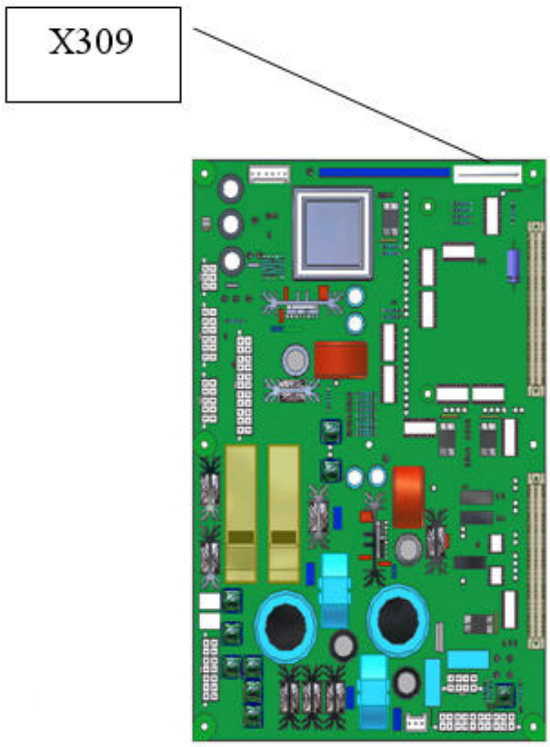
- The data exchange via the CAN bus between the communication CPU and the operating panel of the N3 has been interrupted or is faulty.
- Data on the CAN network to user panel has stopped.

Causes:

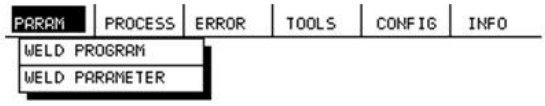
- *Damaged user panel*
- *Faulty cable between N3 front door and power supply board*
- *Missing 5 volt power supply*
- *Incorrect software version on user panel processor*

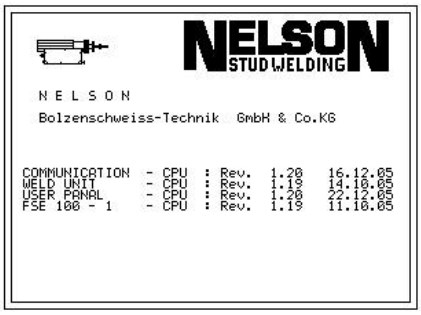
Solutions:

- *Replace user panel*
- *Check cable between front door and power supply board connection X309 for continuity*
- *Check pins on X309 for arcing*
- *Replace power supply circuit board (66-06-60)*



- *Check software version for possible mismatch. The version is located under INFO – SOFTWARE . If mismatch in software, then flash correct version on panel. (see attached flash instructions)*




NELSON
STUD WELDING
N E L S O N
Bolzenschweiss-Technik GmbH & Co.KG
COMMUNICATION - CPU : Rev. 1.20 16.12.05
WELD UNIT - CPU : Rev. 1.19 14.10.05
USER PANAL - CPU : Rev. 1.20 22.12.05
FSE 100 - 1 - CPU : Rev. 1.19 11.10.05

7.10 Code: 0x0A Inverter card!

Inverter card!	**Code: 0x0A**

Description:

- The N3 has detected an error on the inverter card. Flawless operation is no longer assured.

7.11 Code: 0x0B Bus address!

Bus address!	**Code: 0x0B**

Description:

- The address assignment of the connected system components is faulty. Flawless operation via the control bus is no longer assured.

Note:

- A system component address may have been configured doubly.

7.12 Code: 0x0C No EEProm data!

No EEProm data!	Code: 0x0C

Description:

- During initialisation, the N3 unit has detected that no data is available in the EEProm (e.g. layout version, manufacturer identity, etc.). The EEProm has been pre-configured with standard values.

Note:

- The stud welding unit must be re-configured!

8. Parameter Errors Code 0x20-02F

8.1 Code: 0x20 No welding program!

No welding program!	**Code: 0x20**

Description:

- No welding program (data record) has been created for the selected welding program.

  Information 1: Welding output

  Information 2: Type identity

  Information 3: Welding program number

8.2 Code: 0x21 Data pool welding programs full!

Data pool welding programs full!	Code: 0x21

Description:

- The welding program memory is full!

Note:

- Delete unused welding programs.

8.3 Code: 0x22 Write error configuration data!

Write error configuration data!	**Code: 0x22**

Description:

- Currently not implemented !

9. Welding Cycle Errors Code 0x30-0x3F

9.1 Code: 0x30 NIO weld!

NIO weld!	**Code: 0x30**

Description:

- A suspicious weld is pending for the specified welding program.

  Information 1: Indicates the respective welding output.

  Information 2: Indicates the respective type identity.

  Information 3: Indicates the welding program number

Possible Causes:

1. *Work piece surface is dirty - arc voltage is too high*
2. *Molten metal bridging stud to work piece during main arc (Check: Process Monitor arc voltage curves for short circuit)*
   - *Current is too high (voltage is too low) for the application)*
   - *Lift is not enough*
   - *Weld time is too long and weld current is too low, causing short circuit*

9.2 Code: 0x31 No contact!

No contact!	Code: 0x31

Description:

- No work piece contacting (contact) upon welding start.

Information 1: Indicates the respective welding output.

Information 2: Indicates the respective type identity.

Information 3: Indicates the welding program number

Possible Causes:

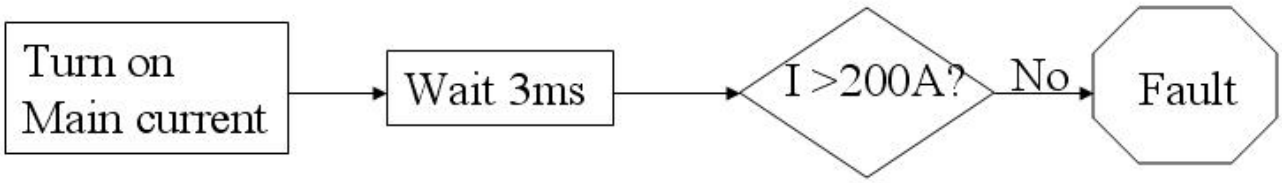
1. *No Contact (distance between Head and Work piece)*
2. *No Stud (only with isolation tube)*
3. *External voltage sense lead cable broken or not connected*
4. *External measure cable broken or not connected*
5. *External sense lead cable not connected on feeder board*
6. *Wrong polarity*
7. *Measure cable to head broken or not connected*
8. *Weld Cable wiring*
9. *Feeder board defective*
10. *N3 Control board defective*
11. *Work piece or surface is dirty or with oil contamination*

9.3 Code: 0x32 Current threshold

Current threshold!	Code: 0x32

Description:

- The current threshold has not been reached after the main current phase's start.



1. *Output cable has too much inductance*
    - *Uncoil cable*
    - *Keep weld cable away from ferrous material*
2. *N3 inverter engine failed – e.g. output diode failed*

9.4 Code: 0x33 Arc voltage lost

Arc voltage lost!	**Code: 0x33**

Description:

- The arc broke or went out during the pilot current phase.

Information 1: Indicates the respective welding output.

Information 2: Indicates the respective type identity.

Information 3: Indicates the welding program number.

Note:

- The stroke at the gun or welding head may be too large.

Possible Causes:

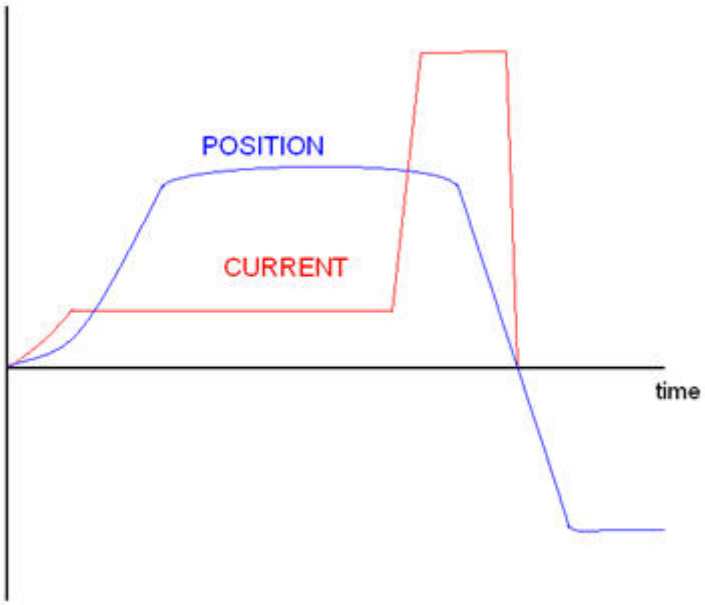
1. Lift is too high

2. Work piece vibration

3. Dirty work piece (Oil)

4. Air blowing at arc

- *15 ms after pilot arc start, measure 4ms (16 samples)*
- *Average voltage should be > 75 V*


POSITION
CURRENT
time

9.5 Code: 0x34 No arc!

No arc!	Code: 0x34

Description:

- No arc could be ignited during the pilot current phase.

Information 1: Indicates the respective welding output.

Information 2: Indicates the respective type identity.

Information 3: Indicates the welding program number

Note:

- Possibly no stroke at the gun or welding head.

Possible Causes:

1. No lift or no movement head

2. Work piece moving relative to stud

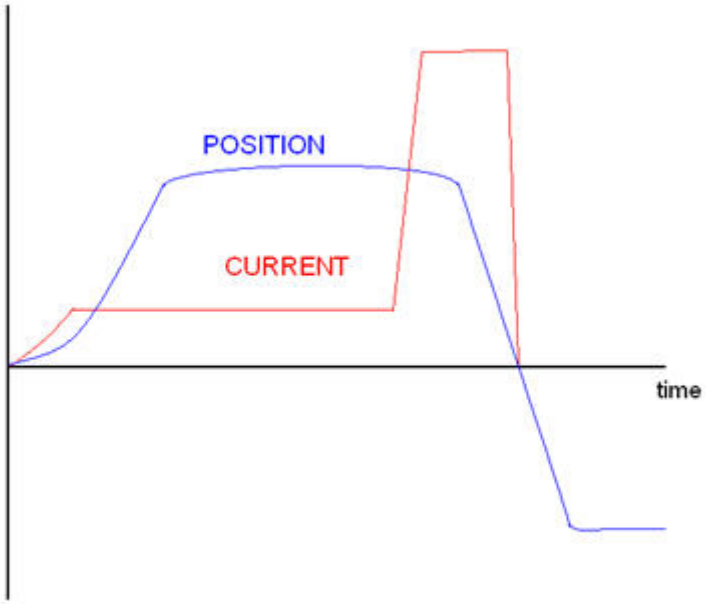
Fixtime is not supporting workpiece adequately causing workpiece vibration after stud is lifted off the workpiece.

2.a Workpiece is too thin in thickness

2.b Fixtime a clamp is loose

3. *Short circuit between work piece and stud*
4. *Stud temporarily welded with pilot current*
5. *Lift too short*
6. *Inverter defect*
7. *CAN-BUS – process data defect*
8. *Feeder board problem*
    - *A/D Converter*
    - *Wiring on board*

After turning on the pilot arc for 15 ms, the arc voltage must be over 15V. If not, “no arc” error is active.



9.6 Code: 0x35 Welding cycle interrupted!

Welding cycle interrupted!	Code: 0x35

Description:

- The welding sequence has been interrupted, i.e. the start signal is switched off. The welding sequence has not been completed!

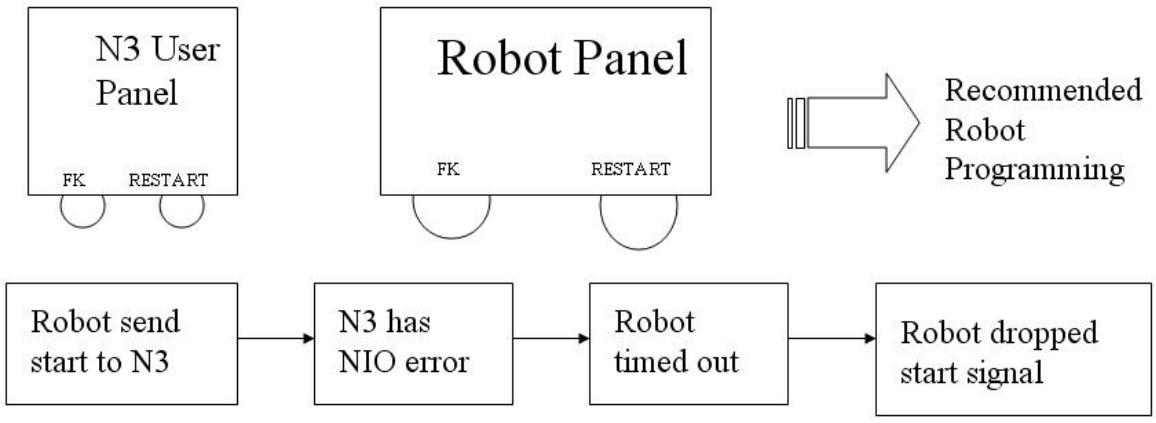
Information 1: Indicates the respective welding output.

Note:

- This message is generated when the start signal is switched off before the FK signal.

Start signal from robot is dropped before weld complete (FK) is sent to robot. This could be caused by robot using Spot Welding Software (e.g. Fanuc Spot Tool) for stud welding

IN THE EVENT OF NIO WELD:



Work-Around (Temporarily suppressing this error)

Set NIO Count to zero ⇨ 'FK' is sent for NIO weld

9.7 Code: 0x36 Synchronisation error!

Synchronisation error!	**Code: 0x36**

Description:

- Currently not implemented !

9.8 Code: 0x37 Welding process active!

Welding process active!	Code: 0x37

Description:

- Currently not implemented !

9.9 Code: 0x38 Welding process error!

Welding process error!	Code: 0x38

Description:

- Currently not implemented !

9.10 Code: 0x39 Timeout welding process !

Timeout welding process!	**Code: 0x39**

Description:

- Currently not implemented !

9.11 Code: 0x3A No measured values!

No measured values!	Code: 0x3A

Description:

- The N3 has no measured values.

9.12 Code: 0x3B Plunge obstruction!

Plunge obstruction!	Code: 0x3B

Description:

- The mechanically adjusted protrusion of the stud compared to the supporting tube is smaller than the plunge depth configured in the welding program.

  Information 1: Indicates the respective output.

Note:

- A larger protrusion should be adjusted as, otherwise, no sound welding quality can be assured.

9.13 Code: 0x3C Protective gas failure

Protective gas failure!	**Code: 0x3C**

Description:

- A protective gas failure has occurred.

Information 1: Indicates the respective output.

9.14 Code: 0x3D Simulation

Simulation!	**Code: 0x3D**

Description:

- Simulation active.

Information 1: Indicates the respective output.

10. Infeed Errors Code 0x40-0x4F

10.1 Code: 0x40 No R-position!

No R-position!	**Code: 0x40**

Description:

- The welding head is **not** in the home position or could not be driven to the backward position.

  Information 1: Indicates the respective output.

Possible Causes:

1. *Proximity switch is loose*
2. *Axis is blocked*
3. *Cable from head to feeder is damaged*
4. *Low air pressure*
5. *Chuck is welded to work piece*
6. *Stud in the loading head blocks the movement*
7. *Protective bellow is not installed properly or has no bleed hole*
8. *Spatter holds the chuck to the stud after welding*

10.2 Code: 0x41 No V-position!

No V-position!	**Code: 0x41**

Description:

- The welding head could not be driven to the forward welding position.

  Information 1: Indicates the respective output.

10.3 Code: 0x42 Timeout infeed!

Timeout infeed!	Code: 0x42

Description:

- The maximum time for the welding shaft's movement from the backward to the forward position or vice versa was exceeded.

  Information 1: Indicates the respective output.

10.4 Code: 0x43 Infeed error!

Infeed error	Code: 0x43

Description:

- The welding shaft could not be fed properly after 3 attempts. The cause is indicated by the additionally indicated error.

  Information 1: Indicates the respective output.

  Information 2: Indicates the error cause.

Time out movement, head not retracted

1. No/Low air pressure

2. Gun cable or its connection

3. Servo axis is blocked

- *Stud jam*
- *Feed tube is not secured to the head. If moves and blocks the axis*
- *To check:*
  - ➢ *Release break*
  - ➢ *Move weld axis by hand*
  - ➢ *Check LED (encoder pulses) flashing on the feeder board*
  - ➢ *In software version 2, the axis position is displayed on the user panel when break is released*

4. Feeder board: 90V fuse is blown

10.5 Code: 0x4A Angular position NIO

Angular position NIO	Code: 0x4A

Description:

- The angular position of the PSE hand-held gun is not given.

  Information 1: Indicates the respective welding output.

  Information 2: Indicates the respective type identity.

  Information 3: Indicates the welding program number

11. Welding Tool Errors Code 0x50-0x5F

11.1 Code: 0x50 Servo controller defective!

Servo controller defective!	**Code: 0x50**

Description:

- The servo drive (linear motor) of the welding shaft is faulty and has been switched off.

  Information 1: Indicates the respective output.

11.2 Code: 0x51 Servo init. faulty!

Servo init. faulty!	Code: 0x51

Description:

- Initialisation of the servo system is not possible!

Information 1: Indicates the respective output.

11.3 Code: 0x52 Servo error input!

Servo error input!	Code: 0x52

Description:

- The error input of the servo system is active!

Information 1: Indicates the respective output.

11.4 Code: 0x53 Servo overload current!

Servo overload current!	**Code: 0x53**

Description:

- The current consumption was too high over a lengthy period of time.

  Information 1: Indicates the respective output.

12. Feeder Errors Code 0x60- 0x6F

12.1 Code: 0x60 Rail filling level min.!

Rail filling level min.!.	Code: 0x60

Description:

- The stud rail of the FSE xx feeder is empty or the initiator has not been attenuated.

Information 1: Indicates the respective output.

12.2 Code: 0x61 Feeder filling level min.!

Feeder filling level min.!	**Code: 0x61**

Description:

- The filling level of the Feeder pot of the FSE xx Feeder has been underrun or the initiator has not been attenuated.

Information 1: Indicates the respective output.

12.3 Code: 0x62 Bunker filling level min.!

Bunker filling level min.!	Code: 0x62

Description:

- The bunker filling level of the FSE xx Feeder has been underrun or the initiator has not been attenuated.

  Information 1: Indicates the respective output.

12.4 Code: 0x63 Feeder cover open!

Feeder cover open!	**Code: 0x63**

Description:

- The Feeder cover of the FSE xx Feeder is open. Operation of the sorting blade is prevented.

  Information 1: Indicates the respective output.

12.5 Code: 0x64 Lack of compressed air!

Lack of compressed air!	Code: 0x64

Description:

- The FSE xx Feeder's compressed air supply is lacking or the minimum pressure has been underrun.

Information 1: Indicates the respective output.

12.6 Code: 0x65 Feeder key switch!

Feeder key switch!	Code: 0x65

Description:

- Currently not implemented !

13. Feed Errors Code 0x70-0x7F

13.1 Code: 0x70 No stud fed!

No stud fed!	**Code: 0x70**

Description:

- No stud was fed. The timeout condition for the feed process has expired or the ring sensor has not been activated.

  Information 1: Indicates the respective output.

Note:

- A stud may be stuck in the feed system!

13.2 Code: 0x71 Wrong stud!

Wrong stud!	Code: 0x71

Description:

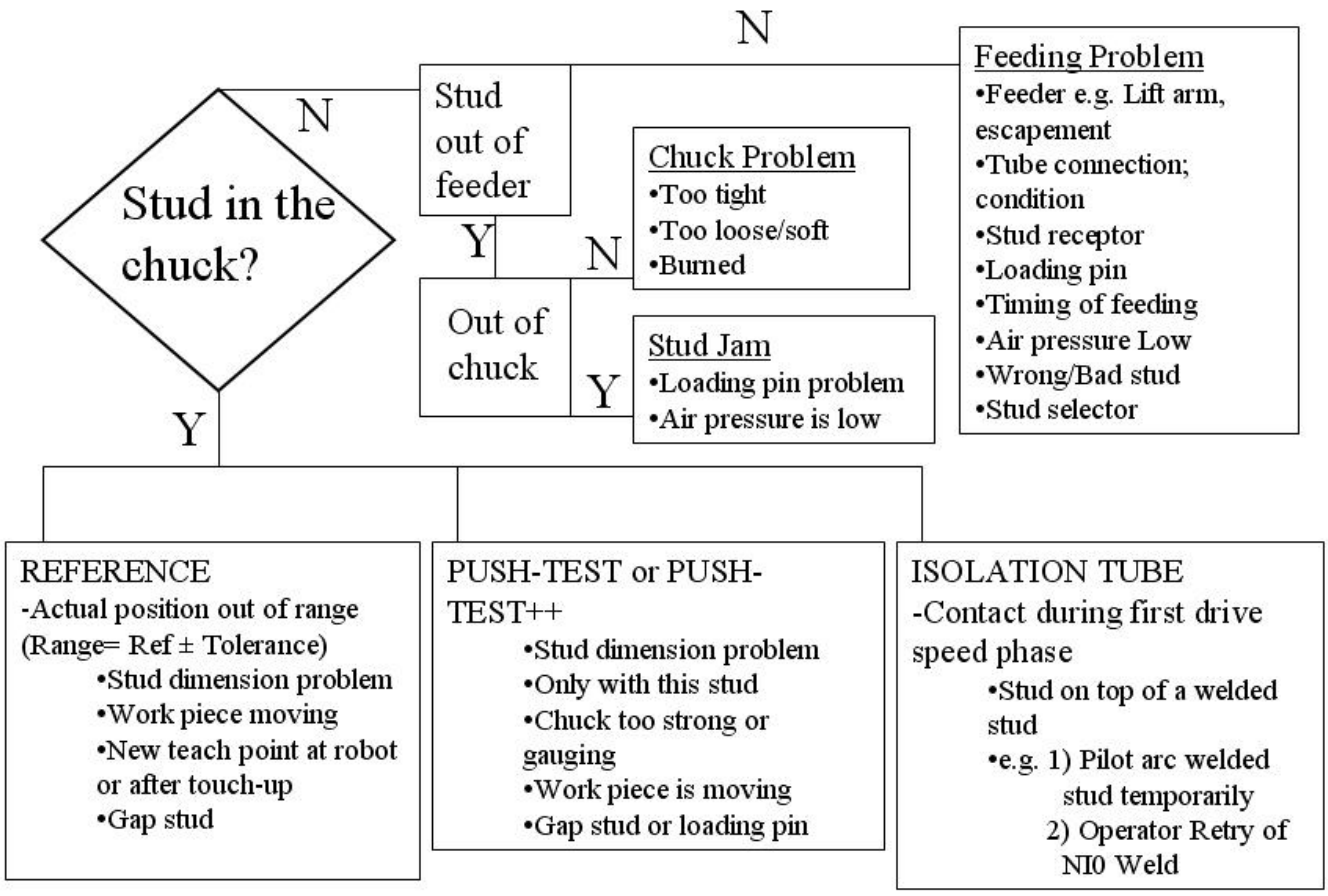
Stud detection variant: Insertion

- A wrong stud or no stud at all was fed.

Stud detection variant: Reference

- A wrong stud or no stud at all was fed or the work piece lies outside the IO window (IO value).

Information 1: Indications the respective output.



see also:

- *Feeding Problem*
- *Symtom:*
- *Lifting arm scoops up nothing because all the studs are on the sides and out of the reach of the lifting arm*

Solutions:

- *Open up air valve to vibrate feeder to shake FSE 100 every time you feed a stud*
- *Adjust the "minimum switch level" (inside of sorting container), up is possible, to increase the quantity of studs in this chamber.*
  - *Reason: With more studs in this chamber, together they became heavier and with this, more easily to fall down to the arm.*

- *Increase the speed in arm when it move to (back or home) position.*
    - *Reason: With more speed in arm movement, the feeder has a tendency to vibrate. You can also do that when the arm come to the front position, but you must take care to the studs don't throw from the arm.*

- Chuck Problem
-

Referenz Methode

Push Test / Push Test ++

- *Isolation Tube*

13.3 Code: 0x72 Incorrect stud!

Feed fault intelligent stud feed!	**Code: 0x72**

Description:

- Incorrect setting of the evaluation electronics of the welding head's light barrier or loading pin not in home position.

  Information 1: Indicates the respective output.

13.4 Code: 0x73 Feed fault loading pin!

Feed fault loading pin!	Code: 0x73

Description:

- The loading pin is not in the home or loading position or the timeout condition for the loading pin control has expired.

  Information 1: Indicates the respective output.

13.5 Code: 0x74 Förderstörung optischer Sensor!

Feed fault optical sensor!	**Code: 0x74**

Description:

- Currently not implemented !

13.6 ode: 0x75 Feed fault optical sensor!

Feed fault selector!	**Code: 0x75**

Description:

- The selector position is incorrect. No stud can be fed as the separator blocks the feed route.

13.7 Code: 0x76 Stud feed protective circuit open!

Stud feed protective circuit open!	**Code: 0x76**

Description:

- The protective circuit (welding head feed tube limit switch, separation limit switch, if available, Feeder cover) of the feed unit has been interrupted. No new feed process will be executed and any active feed process will be terminated.

  Information 1: Indicates the respective output.

13.8 Code: 0x77 Stud/program allocation

Stud / program allocation!	Code: 0x77

Description:

- The last fed stud does not correspond to the stud type allocated in the welding program.

  Information 1: Indicates the respective welding output.

  Information 2: Indicates the respective type identity.

  Information 1: Indicates the respective output.

14. CAN Errors Code 0x80-0x8F

14.1 Overview CAN BUS Errors

Possible Causes:

1. *CAN connector on each board*
2. *CAN termination plug is missing on the last feeder in the DAISY-Chain*
3. *One feeder is disconnected without cycle power*
4. *Bad CAN cable*
5. *Feeder board or control board is damaged*
6. *45V CAN Bus power supply will see error message*
7. *CAN I & CAN II positions are swapped on feeder PCB on control PCB*

14.2 Code: 0x80 CAN-message faulty!

CAN message faulty!	**Code: 0x80**

Description:

- A faulty message was sent during transmission of the CAN messages.

14.3 Code: 0x81 CAN-Message Timout!

CAN message timeout!	**Code: 0x81**

Description:

- A timeout condition for an expected CAN message has expired.

14.4 Code: 0x82 CAN transmission FIFO full!

CAN transmission FIFO full!	Code: 0x82

Description:

- The transmission FIFO is full! No further CAN messages can be transmitted.

14.5 Code: 0x83 CAN 1 bus error!

CAN 1 bus error!	**Code: 0x83**

Description:

- The monitoring unit for CAN bus 1 has detected a line error.

14.6 Code: 0x84 CAN 1 bus OFF!

CAN 1 bus OFF!	Code: 0x84

Description:

- The monitoring unit for CAN bus 1 has switched the bus offline.

14.7 Code: 0x85 CAN 1 bus error!

CAN 1 bus error!	**Code: 0x85**

Description:

- The monitoring unit for CAN bus 1 indicates that the CAN bus has received several faulty messages. The bus quality is poor!

14.8 Code: 0x86 CAN 1 bus error!

CAN 1 bus error!	Code: 0x86

Description:

- The monitoring unit for CAN bus 1 indicates that an error has occurred.

14.9 Code: 0x87 CAN 2 bus error!

CAN 2 bus error!	Code: 0x87

Description:

- The monitoring unit for CAN bus 2 has detected a line error.

14.10 Code: 0x88 CAN 2 bus OFF!

CAN 2 bus OFF!	**Code: 0x88**

Description:

- The monitoring unit for CAN bus 2 has switched the bus offline.

14.10.1 Code: 0x89 CAN 2 bus error!

CAN 2 bus error!	Code: 0x89

Description:

- The monitoring unit for CAN bus 2 indicates that the CAN bus has received several faulty messages. The bus quality is poor!

14.11 Code: 0x8A CAN 2 bus error!

CAN 2 bus error!	**Code: 0x8A**

Description:

- The monitoring unit for CAN bus 2 indicates that an error has occurred.

14.12 Code: 0x8B CAN bus monitoring

CAN bus monitoring!	**Code: 0x8B**

Description:

- The internal monitoring loop indicates an error.

15. External Communication Errors Code 0x90-0x9F

15.1 Code: 0x90 No program selection!

No program selection!	**Code: 0x90**

Description:

- No program selection upon welding start.

15.2 Code: 0x95 Incorrect interface module

Incorrect interface module!	**Code: 0x95**

Description:

- The interface card cannot be initialised or is faulty. Hardware error!

15.3 Code: 0x96 Bus initialisation error!

Bus initialisation error!	**Code: 0x96**

Description:

- Interrupted or faulty communication between the communication CPU (CoCP) and the interface card InterBus S (customer interface).

15.4 Code: 0x97 No bus communication!

No connection to bus!	**Code: 0x97**

Description:

- The InterBusS operation is inactive.

15.5 Code: 0x98 Bus Idle!

Bus in idle mode!	**Code: 0x98**

Description:

- The InterBusS operation is inactive.

15.6 Code: 0x99 Bus reset!

Bus reset!	**Code: 0x99**

Description:

- The InterBus S control has signalled a bus reset.

16. Process Errors, Code 0xA0-0xAF

16.1 Code: 0xA0 Unacknowledged error!

Unacknowledged error!	Code: 0xA0

Description:

- A function cannot be executed due to an unacknowledged error pending for the respective output. The error has been entered in error status!

16.2 Code: 0xA1 Process fault

Process fault!	**Code: 0xA1**

Description:

- The device is subject to a process fault!

17. Facility Errors, Code 0xB0-0xBF

17.1 Code: 0xB0 Feeder configuration error!

Feeder configuration error!	**Code: 0xB0**

Description:

- During initialisation, the N3 has detected that the configured Feeder type does not correspond to the actually connected Feeder!

17.2 Code: 0xB1 Tool configuration error!

Tool configuration error!	**Code: 0xB1**

Description:

- During initialisation, the N3 has detected that the configured welding tool does not correspond to the actually connected welding tool!

17.3 Code: 0xB2 Maintenance 80

Maintenance 80!	**Code: 0xB2**

Description:

- 80 % of the set maintenance interval have expired.

  Information 1: Welding output

  Information 2: Component

17.4 Code: 0xB3 Maintenance 100

Maintenance 100!	**Code: 0xB3**

Description:

- 100 % of the set maintenance interval have expired.

  Information 1: Welding output

  Information 2: Component

17.5 Code: 0xB4 Maintenance

Maintenance!	**Code: 0xB4**

Description:

- Maintenance counter reached.

Information 1: Output

Information 2: Chuck = 0

Head / gun = 1

Component = 2

17.6 Code: 0xB5 Error frequency

Error frequency!	Code: 0xB5

Description:

- The error frequency per hour is too high.

The following errors are taken into account:

- ***NIO weld***
- ***No contact***
- ***Current threshold!***
- ***Arc break***
- ***No arc***
- ***Incorrect stud***

17.7 Code: 0xBA Ethernet ON

Ethernet ON!	Code: 0xBA

Description:

- Ethernet online.

17.8 Code: 0xBB Ethernet OFF

Ethernet OFF!	**Code: 0xBB**

Description:

- Ethernet offline.

17.9 Code: 0xBC Ethernet

Ethernet!	Code: 0xBC

Description:

- Ethernet socket error.

17.10 Code: 0xBF Facility configuration

Facility configuration!	**Code: 0xBF**

Description:

- The detected configuration does not correspond to the set configuration!